

The MILLING WORLD

and CHRONICLE OF THE GRAIN and FLOUR TRADE.

PUBLISHED EVERY THURSDAY MORNING.

VOL. X.—No. 8.

Buffalo, N. Y., June 19, 1884.

\$1.50 Per Year.
Single Copies, 8 Cts.

HOW TO DETERMINE THE ADMIXTURES OF ORGANIC OR INORGANIC SUBSTANCES IN RYE AND WHEAT FLOUR.

(Prize essay of the German Millers' Association, by Dr. L. Wittmack, Professor at the Agricultural College at Berlin.)

Translated by THE MILLING WORLD.

FOR years men have tried to discover the proper methods for the determination of adulterations of flour, and the literature on the subject is so large that we may ask, was it worth while to offer a prize for another method? And yet it is necessary, for the older methods, reprinted and republished from one book into another, are unreliable and have a value only from a historical point of view. They all sprang into existence prior to the time when the microscope offered such an important aid in investigations as it does to-day; all the older methods relied upon chemical principles, color tests, etc., and yet they must not be rejected altogether, for, as we shall see later on, microscopical investigations have to go hand in hand with physical and chemical tests, if we are to obtain reliable results. Flour is such a complicated substance, adulterations and admixtures are so manifold, that the tests have to be made in all possible directions.

The first thing necessary to obtain perfectly reliable results is a microscope. It is well that the price of these instruments is no longer as high as it has been, and a microscope for the determination of flour can be purchased for \$50 or \$60. All large milling establishments, expert committees of exchanges, etc., should possess a microscope in order to form an intelligent opinion about the purity of the flour, bran, etc. The art of manipulating the instrument for these purposes can be attained after a few weeks' practice, even by hands which have been used to do the hardest work. A microscope is absolutely necessary if we want to determine whether rye and wheat has been mixed with another flour or contains impurities, such as ergot, fungi, etc. If we suspect adulteration by means of mineral substances, the microscope is not necessary; then we must resort to chemical analysis, we must analyse the ashes, a task easy enough for the chemist, but not advisable to the layman on account of the want of a well-equipped laboratory. We will find, later on, an easy method to distinguish mineral substances in flour.

TEST FOR THE GRAIN.

Every expert can, by practice, obtain the necessary knowledge to determine whether a certain wheat or rye is adapted to certain special purposes, but it is well to bear in mind that there are several artifices by means of which poor grains are made to resemble better grades. One of these is "oiling." In France it is used more than with us. There we are told, it is customary with many farmers to oil the grain if it is not bright and fine looking. One to two spoonfuls of oil are sufficient for twenty sacks of grain. A simple test consists in placing a few grains of the suspected quantity on blotting paper and see whether they produce a grease spot. Another test consists in shaking a small quantity of grain with ether in a small bottle, and then allow the ether to evaporate, when the oil remains; or a few grains are shaken up with bronze powder, which closely adheres to the oiled kernels, but very loosely,

if at all, to the dry grains. We all know that the seed of many weeds are often found among the grain, but the most of it can be removed by our present improved cleaning machinery; seeds of rust, ergot, and some of the other parasitic vegetation, however, will find their way into the flour in spite of all care.

TEST FOR FLOUR.

Theoretical part.—Before going into the different tests, it may be well to review briefly the anatomy of the wheat and rye kernel, which are alike in their main portions. The kernel is not a seed, but a whole fruit. The one seed contained in this fruit is fastened to the external covering of the fruit by its own integument. The whole grain is formed by the epidermis, the embryo and the starch kernel, which latter is destined to serve as food to the embryo. The external covering can be divided into two parts, according to their origin: 1, the epidermis or fruit covering, and, 2, the dermis or seed covering. Both together form the bran, but the dermis generally retains a small part of the external layer of the starch granules.

The epidermis.—The epidermis is formed in its external layer of transparent, lengthened cells, which run in a longitudinal direction over the grain in several layers, and are called the "longitudinal cells." The external layer has smaller cells in wheat than in rye, but the cells of all the layers in wheat are proportionally, as well as absolutely, much smaller, and the walls are thicker. These cell walls are not of a uniform thickness, but are thickened in an alternate manner, so as to appear porous, and through the thin places the sap circulates from one cell into the other, prior to the maturity of the grain. The cells of these external longitudinal layers in the mature grain are flattened by the pressure to which they are subjected internally by the starch kernel to such an extent, that a cross section reveals only a very small cavity. As a consequence of the thickening of the cell walls, and the partial deposition of earthy substances between its cells, the epidermis forms a strong and efficient protection against external dangers.

Towards the apex of the fruit, these longitudinal cells become shorter and irregular, and the most external layer sends out a number of longer or shorter hairs. These hairs form the most convenient distinction between rye and wheat flour, as shown in 1882 by the author. Although these hairs, the so-called "beard," are removed in their largest part during the various cleaning processes, and a certain quantity of it, especially of that portion situated inside of the crease, finds its way into the flour, and cannot be removed satisfactorily even by the best bolting. The wheat has hairs with thick walls, and a small canal inside. Generally speaking, we can say that in wheat the diameter of the canal is less than the thickness of the wall, in rye it is *vice versa*.

Underneath these longitudinal cell layers we find a transverse layer, which we will call the circular layer. Its cells run right around the grain in a single thickness. These cells offer another nice distinction between wheat and rye; in the former, they are almost double the length of those in the rye, and much stronger, and its thickened walls have a chain-like appearance. Later-

ally they are closer together in wheat than in rye. The circular cells of the wheat measure 0.014 to 0.192 mm. in length, of rye, 0.072 to 0.090 mm. These differences in length are visible only in the middle of the grain, likewise the closer crowding laterally; towards the ends of the grain the cells become shorter and more irregular. A cross section of the rye circular cells show that their internal margin and their end walls are much thicker than the external wall.

In fine grade flours we find branny particles only in very small quantities, and it will be a difficult task to secure measurements of the transverse cells, but this is not necessary, because if the strong and closely linked chain-like appearance of the walls can be seen in every part of the cell, we have wheat; if this is less decided and more lengthened, and the ends of the cell walls are thick and rounded, we have rye.

During the period of flowering, and for a short time afterwards, this circular layer of cells is filled with chlorophyll granules; later on these disappear and the cells are as empty as the cells of the longitudinal layer. In rye we find the chlorophyll sometimes even after maturity, in wheat this happens only in exceptional cases.

Longitudinal and circular layers together, form the epidermis which is formed from the walls of the ovary of the flowering grain. In the one-grained wheat *Triticum monococcum*, the Roman wheat, *Triticum amyleum*, and the spelt, *Triticum spelta*, the longitudinal layer of cells is less pronounced, as the grains are already well protected, and the epidermis is considerably thinner. In some of the English wheats it is not as thick as in those of German growth.

UTILIZING NIAGARA FALLS.

The following is an extract from a paper read by Mr. Benj. Rhodes at the recent meeting of the American Association of Civil Engineers, held in this city.

Dynamic electricity is used substantially only for the electric light, but this use has become a great industry. It is the object of this paper to show what has been done and what may be done toward the utilization of Niagara for electrical purposes. The power of Niagara can be estimated very approximately. The average flow of the river according to the many careful measurements is 275,000 cubic feet per second. The fall in the river through the rapids immediately above the falls is sixty-five feet. The height of the falls is 165 feet, making a total of 230 feet; thus we have for the whole power 7,000,000 horse power. To utilize this amount of power by water wheels, generate electrical currents, and transmit to various cities within 500 miles would necessitate a plant representing at least \$5,000,000,000. Such figures as these give some idea of the enormous amount of power here in reserve.

A small proportion of the power of Niagara is already utilized, and a much larger amount can be developed at moderate cost. On the Canada side the entire use is represented by a small overshot wheel under six feet head, which has for many years propelled a solid piston single acting pump, furnishing a meagre supply of water to the adjoining village. On the American side, along the rapids on Goat Island and the mainland,

there are five separate raceways using from four to sixteen feet head, and developing in all 800 to 1,000 horse power, most of which is now in actual use. If the project for the appropriation of lands for a State reservation at Niagara is carried out, all these races will come within the fixed bounds of the park, and will of course be odious in the eyes of the commissioners and be swept away.

The greatest power now in use at Niagara, however, lies outside the proposed State Park. It is the Hydraulic Canal and was constructed about 1855. It is cut through solid rock across the peninsula on which the village of Niagara Falls is built, taking the water from the extreme head of the rapids and discharging below the falls, giving opportunity to use the entire head of 230 feet. The canal is nearly one mile long and was planned 100 feet wide and ten feet deep. It has been excavated but seventy feet, and half the distance is but thirty-five feet wide. It is at present partially filled with debris, being at certain points no more than five feet in depth. At the lower end is a basin nearly at right angles with the canal, which may be extended as needed along the river frontage belonging to the Hydraulic Power Company. The canal lay idle for a quarter of a century, and it remained for an enterprising citizen of Buffalo, Mr. J. F. Schoellkopf, possessed of large capital and zeal, to open up this great power. At the time of his purchase—in 1878—there was only one water-wheel on the canal. There is now a large and increasing number of buildings for manufacturing purposes distributed along the high bank of the river, using an aggregate of nearly, or quite, 5,000 horse power. The wheels in these buildings are set under heads of from fifty to 100 feet, and discharge the tail water over the side of the precipice, the various streams falling over 100 feet to the river below. Some of these wheels are of large size when the head is considered, several being capable of giving 1,100 to 1,500 horse power each. The last two years have seen great improvements in the making and setting of wheels, and the working of all the mills is now regular and continuous.

Further developments of power at Niagara may be made at little expense. The Hydraulic Canal can be deepened and widened and wheels may be set under greater heads, the total amount thus made available here being equal to the necessities of many years. Large powers may also be developed at Goat Island and Prospect Park in case the State Park plan is not effected; in either place, 10,000, 25,000 or even 50,000 horse power being easily available. It may safely be said that the use of Niagara has just begun. Low water is unknown; troubles from ice are slight; hours of use are not limited to eight or ten, but twenty-four hours in the day, and 365 days in the year, and unlimited power is ready, making this the most reliable as it is the grandest water power in the world.

ENGLISH MILLING STATISTICS.

According to the last census the population of England and Wales numbered 25,974,439 in 1881, against 22,712,266 in 1871. During these last ten years the number of the agricultural population decreased, by 273,954; while the manufacturing popula-

tion increased by 1,235,642. The number of millers decreased from 29,720 in 1871 to 23,162 in 1881, while the number of grain and flour dealers was, during the same time, reduced from 11,964 to 8,180. On the other hand the lists of bakers increased during the ten years from 52,733 to 71,032, and that of the confectioners from 9,337 to 12,483. Millwrights, who numbered 7,583 in 1871, are represented by only 6,940 in 1881. The number of foreigners employed in England in this branch of industry is remarkably small, only two in 1871, and only one in 1881. In the other branches we find only 13 foreign millers and 55 foreign grain and flour merchants in 1881 against six millers and 43 grain dealers in 1871. Among the bakers the foreign elements are better represented. In 1871 there were 1370 foreign bakers employed in England and this number rose to 2,143 in 1881; more than 90 per cent. of the foreign bakers are Germans.

Among London's population in 1881 of 3,816,482, were 419 millwrights, 777 millers and 2,014 flour and grain merchants. In 1871, with a population of 3,254,310 London held 456 millwrights and 940 millers. Whether this general decrease in the number of men employed in the milling industry and its collateral branches throughout England is due to improved machinery or to other causes, cannot be determined from the simple numbers which are available so far. The quantity of material, raw and manufactured, and the quantity of power consumed are necessary for an intelligent elucidation of this question.

WHEAT FARMING.

Like every other commodity, says the *Kansas Farmer*, wheat rises and falls in the market in perfect accord with the law of demand and supply. Prices paid for wheat the last six months or more have not been encouraging. We had not the same faith in better markets for the crop of 1883 than we had in 1882. Accumulations of wheat were so great that no reasonable hope could be entertained that prices would rise before that year's crop was disposed of. There is still a great deal of old wheat in the country, and the supply from Australia, India and Russia is larger every succeeding year. It is not at all likely that there will be any decrease in the quantities of wheat grown in any of the foreign wheat-growing countries. Climatic conditions are good, and the product is good. India wheat recently exhibited in Chicago proved to be better than our grain dealers expected. Tropical wheat is not as good as that grown in colder latitudes; but it is evident that we can not calculate on that to be of any special service to us as farmers. Russia produces first-class wheat and so does Australia. Then, we have Canada right at our doors, as good a wheat country as lies under the sun.

It is an established fact that wheat grows well in cold latitudes, and that, as a general thing, it is not profitably grown in tropical regions. It is equally well understood that in colder climates the variety of crops is less in number than in warmer places. That argues that the Northern farmers will continue to raise wheat, as much from necessity as from desire. They can not grow some crops that are profitable farther south, and they can get little profit out of stock. In warmer latitudes farmers have opportunities which their northern neighbors do not enjoy. They can change from one thing to another as occasion requires and make money out of all. These considerations tend to teach us that the days of profitable wheat farming in the southern one-half of our country are passed. Our Kansas farmers are intuitively falling into this line of thought. Many of them this year have little if any more wheat growing than they expect to use in their own families. But they are doing more than

formerly in other directions. It costs 25 to 30 cents to take a bushel of wheat from Topeka to New York. That is cheap—very low, but it is a large percentage of the value of the wheat. It will be wise to shorten up a little in our wheat and lengthen out in fruit and meat.

INCREASE OF THE FLOUR TARIFF IN FRANCE.

The French government has carefully considered the complaints of the millers, and granted their request sooner than they anticipated, says the *Oesterr.-Ung. Mueller Zeitung*. We are not surprised at the results. The French millers together with the Syndicates have given the first impulse to an improvement in the educational advantages of the country, and their petitions and endeavors in this line have been highly appreciated everywhere. But as the results of such improved education do not appear immediately, the French government has decided to accept help from the present universal remedy, "increased tariff," the effects of which become apparent much speedier, but unfortunately disappear as quick. So the tariff on flour is to be increased from 1 fr. 60 cts. to 3 fr. 75 cts. Of course, in the beginning this will result in a decrease of the imports of fine grade flours, but later on the consumers will become habituated to the higher prices, and if the French milling industry remains in its present stage of stagnation, the former conditions will return, as they have done in other countries before.

We have no official data of the exports of Austria-Hungary, but the estimated figures are 194,000 q. flour exported to France. The increased tariff will react primarily on the German milling industry, which found a good market in France, and the supposition is gaining ground that the political influence of Germany may yet modify the new tariff. For the flour export of Austria-Hungary there is no disadvantage unless the French millers learn how to manufacture along with the finest grade flours, such other grades as are wanted at home. Austria-Hungary cannot retaliate in this matter, it cannot increase the tariff on French goods under the present commercial treaty. All that our government can do at present is to aim at a speedy inauguration of the long contemplated definite tariff treaty between France and Austria-Hungary.

The discussion of this tariff question by the French syndicate for grain and flour, as reported in the *Allgemeine Muehlen Nachrichten*, contain many points of interest, especially an array of statistical facts bearing upon the question, presented by M. Vilgrain with regard to French agriculture.

The French soil, he stated, does not produce a sufficient quantity of cereals to satisfy the home demand. But do we try to increase the national production? Contrary. We do all we can to keep our agricultural population at their present imperfect methods of cultivation. Besides this we must not forget that only a small portion among those classed as "agricultural population" are producers, and a still smaller part are farmers. Our agricultural population is estimated at 19,000,000; of these 6,000,000 are wine growers; 2,000,000 are employed in forest culture; 2,000,000 follow the different branches of agricultural industry, and only 9,000,000 remain for the strictly agricultural population, who cultivate 21,000,000 hectares of land. Of this area (1) 1,500,000 hectares are commune property; (2) 1,500,000 hectares are owned in small parcels by about 1,000,000 people; (3) 7,500,000 hectares, in sections of about 15 hectares each, are owned by 500,000 inhabitants and (4) the other 10,500,000 hectares are claimed by 175,000 owners in divisions of about 60 hectares each.

Now let us see how large a number of

this agricultural population of 9,000,000 people will derive any benefit from the increased grain tariffs. All those of the first and second division consume their own products and perhaps more. Grain tariffs cannot be of any use for them, but may do them harm. Those of the third division can produce annually, in excess of their consumption, perhaps 3,600 pounds for the market, which, under the new tariff, will yield an extra income of annually 23½ francs.

The fourth division finally, producing an average surplus of 7½ tons of grain, are benefitted annually to the extent of 97½ francs each. And for the sake of such minute profits we intend to increase the price of bread for the 30,000,000 people, not classed among the "agricultural population."

The proposed increase of tariff on bread-stuffs is useless, or at least nearly so, and will only induce similar actions in other countries with regard to our exports. As we are at present importers, we are told that such retaliation need not disturb us. This is a serious mistake; no matter what can be said; the only real help must be expected from an improved milling system for France, and that has to come and will come. But then, when the French brands have again gained a reputation for themselves, we will have to meet the same obstacles in foreign markets which we try to build up to-day.

ON THE VARIOUS PRINCIPLES OF MILLING.

By A. Millot, Zurich, in the *Millers' Gazette*.

Roller milling in Europe had its origin in Switzerland in 1832, whence it travelled to Austria and Hungary, and took deep root, especially since the successful trials at Naples of porcelain rolls, 15 years ago, (by F. Wegmann, of Zurich.) These trials led to their extensive use in Switzerland, etc., whence arose the new system of gradual reduction by means of rolls, and which demonstrated that the art of milling required reorganization. Since then thousands of establishments have adopted rolls in Europe and elsewhere, having followed step by step the progress of the early experiments and practice, and mill engineers have arrived at the firm conviction that this style of milling is the most suitable of all previous processes, and will be the system of the future. Indeed, looking back to the old system, it is quite easy to see that it was not suitable for wheat and middlings, and the various bye products resulting from gradual reduction milling, for even when well cleaned, wheat and also middlings, still contain too many impurities to allow fine flour to be produced, especially as these impurities with the germ (which is extracted by the new system) led to a clogging up of the stones, and occasioned considerable heat, which it was impossible to avoid either by aspirators or other artificial means, and which also caused much avoidable waste, besides deteriorating the quality and bread making properties of the flour.

The results of the experiments made with a mass of different implements, machines of all kinds, artificial mills, iron mills, porcelain rolls, etc., led to the conviction that to obtain good grinding results the wheat must be thoroughly cleaned, without fear of the material wasted by this operation, which can be utilized with advantage when separated from the wheat; but if not, it is spread throughout the resulting flour; then the grain should be subjected to slight pressure (between smooth rolls) sufficient just to break up the bits of earth and stones the same size as the wheat, and therefore not separated in the earlier stages; then follows the separation and brushing operations. The good effect of thus first breaking the grain is apparent, when one sees that the

grain thus broken can be thoroughly cleaned by the brush, which also separates the outside germ, epiderm, etc., which are injurious. Wheat thus treated is moreover all the more easily treated on mixed systems, or by pure stone systems; less power is required, the work is more simple, the manipulation being greatly reduced, and consequently it is more advantageous than the high, or Hungarian system of milling. In fact, if one considers the number of machines which are necessary for the equipment of this latter system, the cost, the space required, the number of persons required, the cost of supporting the establishment, repairs, &c., and takes into account the role fulfilled by the rolls for the first and second breaks, it will be seen that these latter breaks are simply a portion of the cleaning process, giving 3 to 4 per cent of flour spoiled by the admixture of crease dirt, as well as the broken pieces of mud, small stones, &c., the *debris* of which is found amongst the semolina of the third break, and which is the plague of Hungarian milling. Moreover, the first break on wheat, not thus first treated on smooth rolls, simply reduces the grain into various sized pieces, which have to be disintegrated or converted into middlings by smooth rolls; hence the multiplication of machinery required to produce suitable middlings and semolina; the result, it is true, is some very fine flour, but there is also much waste. In first subjecting the wheat to slight breaking by smooth rolls a certain percentage is broken longitudinally, in which state the chop is capable of being thoroughly and completely brushed all over, without causing any middlings or flour to be produced, a very desirable matter. Wheat, subject first to fluted rolls, however, yields a larger quantity of flour, than when it is simply compressed. Moreover, when the thus compressed grain particles are subjected to the action of fluted rolls, or stones, the middlings are already made in many cases in the apparently unbroken parts of the grain, and are easily converted, coming out clean from this really first break, requiring no further treatment; the resulting flour being, moreover, in perfect condition, without any loss of quality. This method of first compressing the grain between smooth rolls was practiced more than thirty years ago in many continental establishments, who still continue the practice, thus confirming the value of the operation; but previously subsequent brushing was not resorted to.

It should be well understood that the embryonic membrane of wheat, and especially the germ, are very pernicious in low grinding; indeed, when one considers that 100kil of wheat, contain about 50 grammes of oil in those parts (Algerian wheat contains even more) it will be seen that the oily substance must inevitably clog up the stones and heat them, and deteriorate the "keeping" qualities of the flour, which soon turns rank. Gradual reduction by rolls, and also by stones properly prepared and used, with equal cleaning, dressing, and purifying arrangements, and the use of smooth rolls for the germ middlings, completely avoids these inconveniences. By gradual reduction the embryonic membrane and germ are not reduced, but are easily separated by smooth rolls, which is an immense advantage in favor of rolls, and renders them indispensable in a good system of milling. Another advantage of rolls is that they allow the impure tailings from middlings purifying to be so treated and disintegrated as to allow of a quantity of good flour to be thereby obtained which would otherwise be lost in the offal. Rolls likewise can reduce good semolina to the smallest possible size and fit them for final treatment on stones, which produce a very mellow lively flour, perfectly white and most suitable for bread making. The middlings are reduced on rolls by some, but this is not a rational method of treatment,

especially with iron rolls, for the middlings are thus pressed and caked and must afterwards be subjected to a *detacheur* before being easily dressed. Moreover, flour thus produced does not absorb water sufficiently well in the kneading process, being less sharp than when reduced on stones. To reduce middlings on iron rolls a heavy pressure is required, which causes undue and injurious heat, but when treated by suitable stones, with large eyes, the work is done with greater facility and with less heat. Inferior middlings, however, are more profitably treated on porcelain rolls, but the finishing processes are best done on stones.

It should be well understood that it is wrong to subject the grain to any harsh treatment, that is to say, it should not be treated by machines having a wide working face, nor heavy pressure; rollers are most suitable for this work, but the rolls must be neither of too large nor too small diameter. On the contrary middlings, etc., require a greater working surface, which is only to be obtained in stones. To sum up, the most advantageous and best system of milling is gradual reduction, with perfect wheat cleaning, good dressing, suitably sized rolls, and well arranged stones.

VARIETIES OF WHEAT.

I.

Wheat exists in countless varieties, says Prof. Wm. H. Brewer, of New Haven, Conn., in his report on cereals for the Bureau of Statistics. During all the long history of its cultivation new kinds have been forming, until now these are numberless, differing so widely from each other that botanists and farmers alike are not agreed as to what were originally different species to begin with and what were varieties induced by man's cultivation.

All the many varieties of wheat as well as those of spelt, belong to the genus *Triticum*, and it has been lately advocated that wheat originated in a plant still found growing wild on the shores of the Mediterranean sea, the *Aegilops ovata*, and certain experiments in France appear to countenance this belief; but the matter is by no means demonstrated, and will probably always remain an unsolved problem. Varieties of wheat are now practically innumerable. How many there are is not known, and probably never will be, because there is no standard of agreement as to the amount of difference necessary to constitute a variety. There are several collections numbering some hundreds of varieties each.

The extreme forms are very unlike; they differ in size and shape and physical character of the grain. Some are long, some are short; some have thick bran and some thin; they are brown, red, amber and white; some soft and starchy, others hard and flinty; some are sown in the fall, some in the spring. Most of them have simple heads, but some have branched heads; they differ in their chemical composition, some containing more starch and others more gluten; some are harder than others; and so on through all their essential characters, and as with the other cereals, new varieties are continually originating and old varieties passing out of use. In Europe some varieties are grown only for their straw for the making of hats and other plaited goods.

The whole profit of wheat growing in any region depends upon the variety cultivated; there is no locality, no matter how favorable, that will profitably grow all; and yet from the very nature of the case the whole nomenclature of varieties is very vague, and, except in a comparatively few cases, a name for a kind of wheat has but very little value. Experiments made in this line in one place have little immediate value in another, although a number of series in the United States have especial value upon this subject at large, notably those made at the different

agricultural colleges and university farms. The literature of the subject of varieties is very large. In answer to enquiries made, there were 153 names of varieties of winter and 74 of spring wheat returned, and it is known that a number of popular varieties did not occur in this list. The Fultz and Clawson varieties are reasonably well known and characterized, and yet each is known under a variety of names. Fife we may have had once, but now we have so many Fifes that it hardly means anything. We have the simple Fife, and Hard Fife, and Red Fife, and Scotch Fife, and White Fife, and Siberian Fife, and Minnesota Fife, and Canada Fife, and so on through a long list of Fifes returned to the census. So, too, we have Club; but also Big Club, Little Club, Chili Club, Canada Club, Lonora Club, Oregon Club; and so of any variety, like White Flint, which may have had once a definite meaning, but which has none now. The same may be said of Mediterranean, Black Sea, Odessa, and other popular well known names, used at the present time; they really have ceased to mean definite varieties, but rather a group or class of varieties.

While popularly any deterioration of the wheat is often attributed to the exhaustion of the soil, in this it is perhaps oftener due to the carelessness of cultivation and carelessness in the selection and preparation of the seed than the soil exhaustion. It must be remembered that improved varieties are very artificial productions. There is nothing like them in nature. They have been produced by man's care and labor, by long continued selection of seed, or by physical care of some kind, and they can be maintained only by similar care. When this is relaxed, then the variety is not sustained; and if the conditions which produce it are not maintained, then the character and excellence of the variety cannot be retained.

The nutritious character of the flour depends upon its chemical composition, but its market value depends as much upon its appearance as upon its nutritive qualities. In the classification of varieties, the wheats are sometimes classified as bald or bearded; as hard or soft; red and white; winter and spring. There is no essential difference in the quality of bald and bearded wheats, but bearded varieties are considered, as a whole, more hardy, and some bald varieties become bearded by continued cultivation in a poorer soil and under poorer conditions. As the quality deteriorates, the beard increases. The white or red or brown or amber color of the grain is no index of the color of the bread produced from its flour. Color is given to the bread largely from the germ and from certain cells lying just within the epidermis. The outer bran may be removed from wheat, and the flour be of tolerably good color, and still the bread made from it be dark if it contains any considerable portion of this coloring matter, which generally, under the old style of milling, passes into the middlings.

Under the old system of milling, when rarely more than two grades of flour were made from the same grinding, and often but one was made, beside the middlings and the bran, soft wheats, as they were called, were more popular, but the new process of milling has changed this entirely. The so-called "patent flour," produced by gradual reduction, high grinding, etc., has materially changed the relative value of the different varieties of wheat. In Dakota and Northern Minnesota winter wheat is scarcely grown, the product being practically spring wheat. A few years ago this marked from 10 to 40 cents per bushel less than winter wheat, but under the new milling process, by which millers are enabled to separate the coloring material from the nitrogenous portion, or gluten, a flour of good color and great strength can be produced

from it, and at the present time good spring wheat ranks in value higher than the softer winter wheat.

WITH a view of avoiding explosions, M. Schlumberger recommends that a bottle of ammonia should be placed in each barrel of petroleum. On ignition by accident or otherwise, the bottle would break and the ammoniacal vapors would at once extinguish the fire. Dr. Pietra Santo proposes to apply this method to collieries liable to fire-damp. Tanks filled with ammonia, would, it is said, stop the combustion, as it could not continue in an ammoniacal atmosphere.



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A LINE OF STEVENS ROLLS, of various sizes, either smooth or corrugated, formerly used in the H. D. Rush & Co. Mill, at Leavenworth, Kan. These Rolls have been CONSTRUCTED WITH SPECIAL CARE from the present patterns used by the builders; are refitted and as good as new. They will be sold at HALF PRICE.

Also other makes of Rolls, and those wanting anything in this line should not fail to correspond with us.

NORDYKE & MARION CO.,
INDIANAPOLIS, IND.

SITUATIONS WANTED.

Advertisements under this head, 25 cents each insertion for 25 words, and 1½ cents for each additional word. Cash with order. Three consecutive insertions will be given for the price of two.

SITUATION WANTED.

In a custom grist or flouring mill by a man who has had about two and one-half years' experience as a miller, and can furnish best of references. Address, T. H. NICHOLAS, Forestville, Chautauqua County, N. Y.

SPECIAL ADVERTISEMENTS.

Advertisements of Mills for Sale or Rent, Partners Wanted, Machines for Sale or Exchange, etc., cost 1½ cents per word for one insertion, or 4 cents per word for four insertions. No order taken for less than 50 cents for one insertion, or \$1 for four insertions. Cash must accompany the order. When replies are ordered sent care of this office, 10 cents must be added to pay postage.

WANTED AT ONCE.

A good practical miller to run a small custom and merchant mill, rolls and stone. Must be willing to work. Wages \$50 per month and house. Address, ESPENHAIN & ROY, Lyons, N. Y.

WANTED IMMEDIATELY.

One Knox finisher to run with the sun. Must be as good as new. With perforated sheet steel scourer. Give lowest cash price. Address P. H. RAUCH & BRO., Kelly Cross Roads, Union county, Pa.

FEED MILL FOR SALE.

A portable iron disk feed mill for sale. Well built, large capacity, and in perfect order; unpacked, as delivered from factory. Price, \$40. Address, O. F. F., drawer 208, Buffalo, N. Y.

MILL FOR SALE IN EAST VIRGINIA.

A never-failing water-power flouring and grist mill can be bought at a sacrifice. Unavoidable circumstances forces this property in market. Brick building 44x48. Good investment. For particulars address, C. C. CHAPMAN, Smithfield, Isle of Wight county, Va.

FOR SALE.

A roller flouring mill. Rolls put in last winter. Twenty to forty barrels capacity; never-failing water power, 12 ft. head; in good grain country; on Railroad. Dwelling and eleven acres of land. Upright saw mill. Not for rent. Do not write unless you mean business. Address, FREDRICK AMENDT, Pierce Stark county, Ohio.

STEAM FLOURING MILL FOR SALE OR TO LET.

New buildings and new modern milling machinery. Patent rollers for making new process flour. Also two runs of stone for rye flour and feed, all in complete working order. Large local trade. Situated on line of railroad. Inquire of FIRST NATIONAL BANK, Fishkill Landing, N. Y.

FOR SALE CHEAP.

One 6-horse power engine and 10-horse power boiler, all complete, price, \$350; one 8-horse power engine and 10-horse power boiler, price, \$375; one 10-horse power boiler complete, price, \$350; one 10-horse power Russell Tractor, price, \$500; one 4-horse power vertical engine, price, \$120. Call or address for particulars EZRA F. LANDIS, Lancaster, Pa.

MILL FOR SALE CHEAP.

Situated in the town of East Bloomfield, Ontario Co., N. Y. Mill has 8 run stone and all machinery for doing first class custom and merchant work. There is eight acres of land. Good house, barn and plenty of fruit, the mill is driven by spring stream that never fails. Situated ¼ mill from depot. Reasons for selling ill health. Those wishing to buy mill property would do well to see this. BURRELL BROS, East Bloomfield, N. Y.

FOR SALE.

Water mill at Whitehall, Trempealeau county, Wis. Mill built in 1878. Five run of stone. Mill easily converted into roller mill. Plenty of water all seasons. Good custom trade. Can command trade of Wisconsin Pinery. Home demand for all. Wheat supply from first hands. Mill forty rods from Depot. Side track to mill can be procured. Whitehall is a thriving town and county seat. Good reasons for selling. Address, WHITEHALL MILL CO., Whitehall, Wis.

AN EIGHTY BARREL ROLLER MILL FOR SALE.

I offer for sale two-thirds interest in the "Ashley Roller Mill." The mill is doing a big business, and is making money. Located on railroad track. Good shipping facilities for shipping direct from the mill into cars. Situated in the heart of a good, long-berry wheat section. Reason for selling: I want to build on a larger scale at some other point. No mill within ten miles. For terms and particulars address J. B. MILLER, Ashley, Ohio.

NIAGARA MILLS TO RENT

For a term of years. Having seven run of stone and machinery for flouring. Is very conveniently located in the City of Lockport, N. Y., on the Erie Canal. Operated by a Leffel turbine. Buildings of stone, slate roofs, ample storage capacity and good water power. Wheat taken directly into the mill from boats, also from trains. Prospects for a large crop of wheat good. Two railroads can take flour in any direction. This is the time to get ready for grinding the new crop. Terms liberal. Apply to L. A. SPALDING, Lockport, N. Y.

YOU CAN BUY THESE CHEAP.

1400 4x8 elevator cups, made by W. P. Myer, 1800 4½x8½, of Indianapolis, Ind.
One No. 6 Excelsior Centrifugal reel.
One "1 J. T. Walter Middlings Purifier.
One "2
Four McCully Corn Cob Crushers.

Each of the above articles is brand new, in perfect condition, just as they left the factories, never having been unboxed, and will be sold very cheap for cash, the owner having changed his plans, has no use for them. Address S., 30 care THE MILLING WORLD, Buffalo, N. Y.

VALUABLE MILL PROPERTY.

Roxbury Mill, on Antietam River, for Rent or for Sale on easy terms. This property comprises a most desirable flouring mill in complete order with three run of burrs, excellent and never-failing water power, 23 acres rich land, good two-story dwelling house, situated one mile northeast of Breathedsville, on Washington County railroad, and five miles southeast of Hagerstown, and on the road leading from the Hagerstown and Sharpsburg pike to the Hagerstown and Boonsboro pike, in as fine and healthy agricultural district as can be found. A full supply of wheat can always be had by wagons, direct from farmers in the neighborhood. The mill has always had local custom for all the mill feed and much of the flour made. For terms, etc., apply to GEO. T. GAMBRILL & CO., Baltimore, Md., or F. F. McCOMBS, Attorney, Hagerstown, Md.



PUBLISHED

EVERY THURSDAY MORNING.

C. A. Wenborne, Proprietor.

Office, Lewis Block, cor. Washington and Swan Streets.
BUFFALO, N. Y.

Mr. THOMAS McFAUL is the authorized agent and traveling correspondent for this paper.

SUBSCRIPTION.

In the United States and Canada, postage prepaid, \$1.50 Per Year, in advance; can be remitted by Postal order, registered letter, or New York Exchange. If currency is enclosed in unregistered letter, it must be at sender's risk.

To all Foreign Countries embraced in the General Postal Union, \$2.25 Per Year, in advance.

Subscribers can have the mailing address of their paper changed as often as they desire. Send both old and new addresses. Those who fail to receive their papers promptly will please notify at once.

ADVERTISING.

Card of Rates sent promptly on application. Orders for new advertisements should reach this office on Tuesday morning, to insure insertion in the week's issue. Changes for current advertisements should be sent so as to reach this office Saturdays.

EDITOR'S ANNOUNCEMENT.

Correspondence is invited from millers and millwrights on any subject pertaining to any branch of milling or the grain and flour trade.

Correspondents must give their full name and address, not necessarily for publication, but as a guarantee of good faith.

This paper has no connection with any manufacturing or mill furnishing business. Its editorial opinions cannot and will not be influenced by a bestowal or refusal of patronage. It has nothing for sale, but its space to advertisers and itself to subscribers.

Entered at the Post Office, at Buffalo, N. Y., as mail matter of second-class.

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A QUESTION OF CORNERS.

OUR valued contemporary the *Cincinnati Price Current*, in its issue for last week, has some very sensible remarks upon the subject of corners. It does not uphold or endorse them, it does not believe they are, in their effects upon commerce, beneficial, but it does hold that if the man who gets "squeezed" could squeeze the squeezer, he would not hesitate to do it, but would set joyfully about it, and with much complacency boast among his friends of the shrewdness he had displayed. All of which is true, and points a good-sized moral. There is no question that the possibility which exists of cornering grain and provisions is detrimental to legitimate business, and so well is this recognized that many plans have been proposed to limit, if not entirely do away with, such possibility. The majority of these plans propose the intervention of legislative action, and perhaps such intervention is the only means which would tend to check or limit the admitted evil, but of its entire efficacy we have very serious doubts. It is also questionable if proper and efficient legislation could be had. The passion for gambling seems to be innate to the human race, even our churches, a majority of them, encourage it in mild forms. The simple fact that there is a risk attending it appears to lend it a zest which renders it impossible of suppression. The boy plays marbles "for keeps;" the deacon "takes a whack" at the "grab-bag;" the poor man buys a lottery ticket; the young man in regions of rusticity, recklessly hazards his lucre on a "hoss race;" the young man in the city buys combinations on base ball, or margins in oil or wheat, and the kings of "the street" manipulate stocks, grain and provisions. And why? Simply for personal gain. No thought is given, apparently, to the fact that someone loses the money, or property, another gains. There is no compensation, nothing that could, by the wildest stretch of fancy, be deemed an

equivalent given the loser. He who is successful in engineering a corner upholds the propriety of it; he who is unsuccessful in breaking it, has little trouble in finding good reasons for denouncing that state of business morals which permits such practices to exist. The successful "squeezer" never "squeals."

Sympathy for the misfortunes of him who attempts to advance or depress the prices of food commodities for gain, is out of place and utterly uncalled for. The effect of combinations to control supplies and regulate values of such commodities is, not infrequently, decidedly damaging and injurious to legitimate commercial pursuits, but what can be done to prevent them? The question is one of serious import, and is yearly assuming greater importance. The stagnation in the general business of this country to day is in a large measure directly traceable to the combinations formed last year to regulate wheat values, and which succeeded so well in their attempts at regulation that our exports of wheat for the eleven months ended May 31, last, were less by 40,000,000 bushels than for a similar period, the previous year—or to put it in dollars and cents an actual loss of more than \$45,000,000. Granted that our wheat last year was inferior in quality and deficient in quantity as compared with the crop of 1882, the fact still remains that much more would have been taken than has been, were it not for the clique which upheld prices beyond the point at which foreign countries could obtain their supplies from various other sources.

AT last we have something definite about flour adulteration, at least it appears, in a degree, definite. A voracious correspondent of one of the great dailies, writing from Washington, says: "In Congressman Green's recent speech on the adulteration of food and drugs, he mentioned some of the doctored articles that are offered for human consumption. They included glucose syrup, soapstone flour, cocoanut shell and red-lead pepper, and so on. Among these the flour said to be made largely of steatite or soapstone seems specially queer, and Mr. Green spoke of it in this fashion: 'Now, sir, what would be your inference, if told by the proprietor of one of these saponaceous quarries, as I have been, that he finds a ready sale for all the soapstone flour that he can grind? And who are your customers? Chiefly commercial millers and sugar refiners.' " Now, if Congressman Green is anxious to make his name immortal, will he visit this saponaceous quarry owner and secure a few names of these "commercial millers," the dates of their orders, the amounts purchased, etc., etc.? Come, Congressman Green, give us light and we'll boom you for the presidency, and carry you into the White House upon a tidal wave of popularity.

THE question of utilizing the falls of Niagara is undoubtedly of great interest to engineers as well as to the consumers of power. But the often discussed law of supply and demand cannot be ignored even in such a discussion, and unless there is a demand for such enormous water power in western New York, all figures about its possibilities are of no avail. Such demand can not be created at a moment's notice. It takes years and is of slow growth. The present hydraulic canal, referred to on another page of this issue, is large enough yet for years to come to supply all possible establishments with power; moreover, with our present unrivalled facilities for coal and grain shipments at Buffalo, there is no special inducement for any one to utilize the power of Niagara. The only thing which may tend towards a more complete utilization will be the development of electrical

plants, capable of conveying power economically long distances. As soon as electrical science has advanced as far as that, the demand for cheap power at any place will be urgent, and Niagara Falls will prove fully competent to furnish the supply.

WE have often been puzzled to find the dividing line between legitimate commerce and swindling. The latest report of a part of the internal machinery of trade, as given by the *Chicago Times* consisted of sending telegraphic despatches to Chicago from Buffalo to the effect that the elevator association at the latter place was at war and the elevator charges had been abolished. Of course, it requires but little to make some people accept a rumor for a fact, providing that rumor meets their expectations, and, although it was stated at Chicago by knowing ones, that the report was incredible and only a trick of the trade, quite a number of vessels and steamers in Chicago accepted 1½ cents freight on corn to Buffalo. Before this fleet had time to arrive at the latter port, a dispatch in Chicago papers announced that peace had been declared in the elevator association, and that the full charges had been resumed. Whether these dispatches were based on fiction or on fact, in either way such tricks will have a deteriorating influence all around by undermining the confidence absolutely necessary for successful business transactions.

WHEN, during the past two years, the electrical exhibitions kept chasing each other in Europe in the most rapid succession, doubts were expressed repeatedly about the feasibility of such a large number of gatherings relating to the same branch, for, no matter how fast electrical science is advancing, three or four months are insufficient to make any very appreciable difference in the applications of electricity. It seems that we, in America, are destined to follow the example of Europe in this respect, for the first electrical exhibition is to be opened in Philadelphia during the first week of the coming September, and it is already announced that arrangements are well under way to hold a great exhibition of electricity in Boston the coming winter. It does seem that such actions ruin the legitimate object of exhibitions of that sort, and reduce them, aye, degrade them to mere shows for the aggrandisement of the city in which they are to be held.

IF any of our readers desire to gain information about Buffalo as a place of meeting for large bodies of men, let them ask some one or more of the members of the American Association of Civil Engineers how they enjoyed their meeting here last week. Among the four or five hundred guests there was not one dissenting voice which proclaimed that the Buffalo meeting had been a success in every respect. Some of the greatest engineering feats in the line of bridge, trestle and canal building recently finished in and around Buffalo, added largely to the many natural attractions which our vicinity offers to strangers, and coupled with a free hearted and generous hospitality on the part of our citizens, every one of the guests felt "at home," and certainly no higher compliment can be paid to the host by the guest than the latter expression of satisfaction.

WE recently published a note from a European exchange, that one of the Budapest mills was to be rebuilt for a new milling system, although it now worked with a complete roller outfit. It seems that the statement has been doubted in Europe, for the *Miller's Gazette* states in its recent issue, that the assertion is perfectly correct, and that the "Victoria" mill at Budapest is to be changed over to the

new system of Nagel & Kämp. Further particulars are as yet wanting, and it is impossible at present, to tell in what the improvements consist, but as we are told that the system has been carefully experimented on for over a year, and pronounced efficient, we shall await a full description of the new plant with some interest.

THE *Chronicle* has a long article upon the subject of spontaneous combustion, and as evidencing its hazard, states that, during the year 1883, there were reported 208 fires originating from this cause, in the United States, involving loss of \$3,115,168. It closes by saying: More than any other part of the one hundred millions swept out of existence in 1883, this loss of three millions and over by spontaneous combustion was unnecessary, and the result of a carelessness verging on criminality. There was scarcely a dollar of this loss that could not have been prevented by the exercise of intelligence, caution and cleanliness, and for the failure to display these qualities the general public is no more culpable than the inspectors of fire insurance companies.

IT is currently reported that our old friend, Jay Gould, is in a very ticklish position. His pet properties are all going to pieces, and his frantic endeavor to "corner" certain stocks is said to be the last despairing effort of a ruined man. We have many times intimated to Jay that he was reaching for more than he could carry, but—by the way, suppose he should be successful in cornering a few lines of stock, he wouldn't be so badly ruined would he? The bear element has possession of all our markets, and so long as it holds on we may expect stories concerning the approaching financial ruin of this, that, and the other heavy operator. Anticipated disaster seldom is experienced; it is the unexpected that happens.

THE report of the Bureau of Statistics, just issued, giving the exports of breadstuffs for May last is not wholly without interest. For instance, our exports of flour for that month were 665,927 bbls., worth \$3,560,802 equivalent to about \$5.35 per barrel. For the same month last year, our exports were 592,086 barrels, worth \$3,461,257 or very nearly, \$5.85 per barrel. Our exports of wheat last month reached 4,748,520 bushels, worth \$4,794,392 or say \$1.009 per bushel. For May 1883 we exported 2,972,397 bushels, worth \$3,470,247 or say a friction over \$1.17 per bushel.

THE oldest banking house in the city of New York, the Bank of New York, recently celebrated the centennial of its founding. We have few old financial or commercial institutions in this country, and such events as that alluded to, certainly merit notice. The bank has caused to be compiled a history of its first hundred years of existence, and, without a doubt, this will be of decided interest to all who may be fortunate enough to secure a copy of it.

IN our issue of May 1 an article entitled, "Austrian Milling Statistics," was credited to the *Oester-Ungar Mueller Zeitung*. This was an error, because it originally appeared in the *Ungarische Muehlen Zeitung*, and should have been called, "Hungarian Milling Statistics." We gladly correct the error as suggested by our German contemporary.

ALL good republicans who are satisfied with the recent nominations can in no better way testify their approval, than by remitting their subscription to THE MILLING WORLD for one year. After the July convention, all good democrats can do the same.

ESTABLISHED 1856.

EUREKA GRAIN CLEANING MACHINERY | GENUINE DUFOUR BOLTING CLOTH

OVER 18,000 MACHINES IN USE.

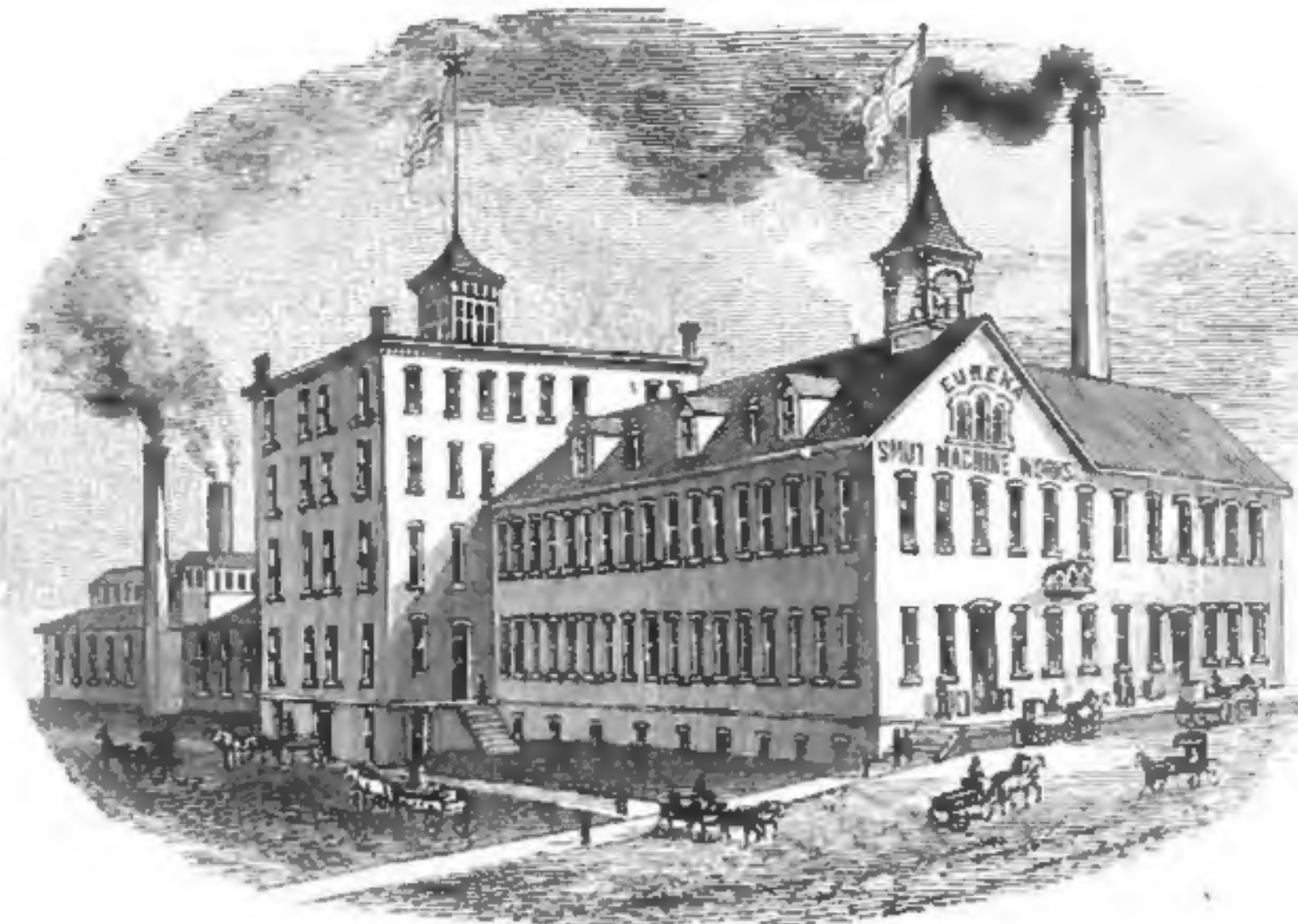
OUR LINE COMPRISES

The Eureka Separator,
The Eureka Smutter and Separator,
Eureka Brush Finisher,
The Eureka Magnetic Automatic Separator,
Silver Creek Flour Packer.

Our establishment is the oldest, the largest and most perfectly equipped of its class in the world, and our machinery is known and used in every country where wheat is made into flour.

HOWES & EWELL,
SILVER CREEK, N. Y.

European Warehouse and Office: 16 Mark Lane, London, E. C. England.
Gen. Agency for Australian Colonies and New Zealand.
Thos. Tyson, Melbourne, Victoria.



We handle this justly celebrated cloth in large quantities, and can fill all orders upon receipt. For such as may prefer a cheaper grade, we offer our

ANCHOR BRAND BOLTING CLOTH.

Guaranteeing it to be equal in every particular to any other cloth on the market, except the Dufour. We have handled it for years, have sold thousands of yards of it, and know it will fully sustain our representations.

Send For Samples of Cloth, Our Style of Making Up, and Prices.

HOWES & EWELL,
SILVER CREEK, N. Y.

THE IMPROVED MORSE ELEVATOR BOLT

THE KNICKERBOCKER CO.

MILWAUKEE, Wis., March 20, 1884.

Gents: Your Bolt is working well and beats anything in the way of a Bolt, centrifugal or any other, that has yet been invented. As a general thing we do not like to certify to a thing on so short a notice, but your machine is an exception. We will experiment as we have opportunity and see how many more machines we can profitably use. Wishing you all success, we remain,

Your truly,

E. SANDERSON & CO.

THE KNICKERBOCKER CO.

JANESVILLE, Wis., April 9, 1884.

Gents: I am fully satisfied with your Morse Elevator Bolt, it is a wonderful machine, and is as far ahead of the old Bolting Chest of Reels as the roller process is ahead of stone milling. Enclosed find draft for the No. 1 sent me, please forward the two No. 1 Bolts bought of your agent, one is for bolting patent stock, and the other low grade stock.

Yours Truly,

C. W. HODSON.

THE KNICKERBOCKER CO.

CLEVELAND, OHIO, April 3, 1884.

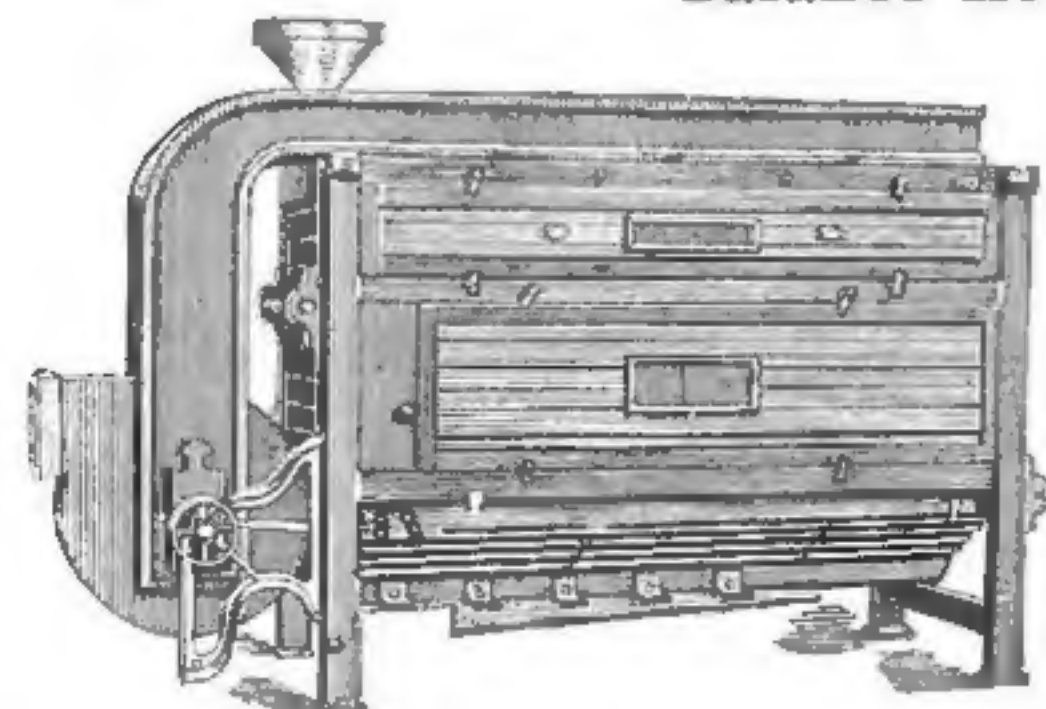
Dear Sirs: Regarding the Morse Bolt we cannot say enough in its praise. We have three different makes of Centrifugal Reels in our mill, and having given the Morse Bolt a fair trial alongside of them we can certify as to their merits. We have demonstrated the Morse Bolt will handle double the quantity the Centrifugal will and produce a better flour and cleaner finish. In fact any material in the mill can be handled with more economy and better results than upon any system we know of. The Morse Bolt being under the complete control of the operator is a point in its favor that cannot be over-estimated, and we believe when its merits are more widely known it will supercede the present mode of bolting.

Yours respectfully,

M. C. DOW & CO.

The Knickerbocker Co., Jackson, Mich.**WOLF & HAMAKER'S LATEST IMPROVED MIDLINGS PURIFIER AND DUST CATCHER**

The Only Machine with Two Sieves, for Fine and Coarse Middlings. The Only Machine with Balance Motion, Consequently no Jarring or Shaking.



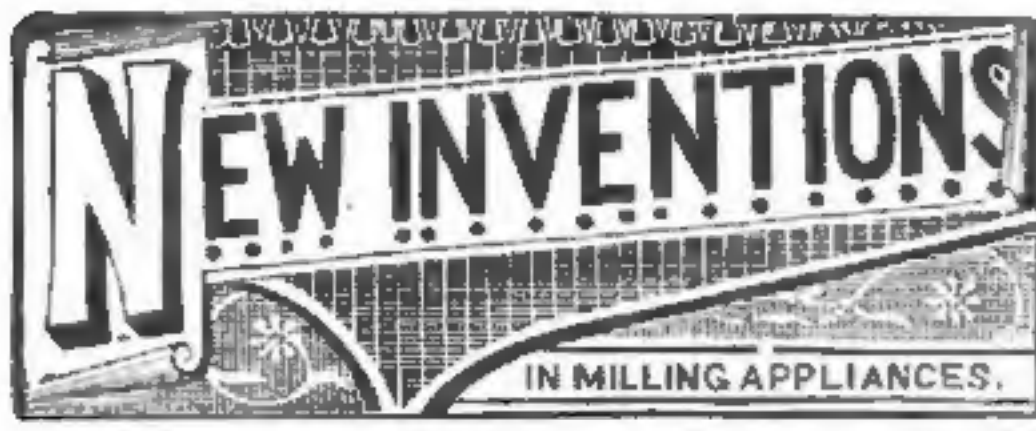
ADAPTED to all styles of milling, high or low grinding, as fine or coarse middlings can be treated separately on one machine. Economy in space, as the machine is a double one. A perfect cloth-cleaning device. No brushing or wearing of cloth. Licensed Under All Conflicting Patents. We are the Agents for the E. P. Allis Roller Mills, and Mill Builders and Contractors. We are at all times prepared to furnish plans and estimates, and to contract for the erection of first-class mills of any desired capacity from 50 to 500 barrels. Parties contemplating Roller Mills or remodeling old mills will find it to their interest to write for Prices and Terms. Wolf & Hamaker's Latest Improved Bolting Chest. Also Mill Furnishings of Every Description.

OUR DUST CATCHER IS GIVING THE BEST OF SATISFACTION, AND OUR PRICES ARE SUCH THAT EVERY MILLER SHOULD HAVE THEM.

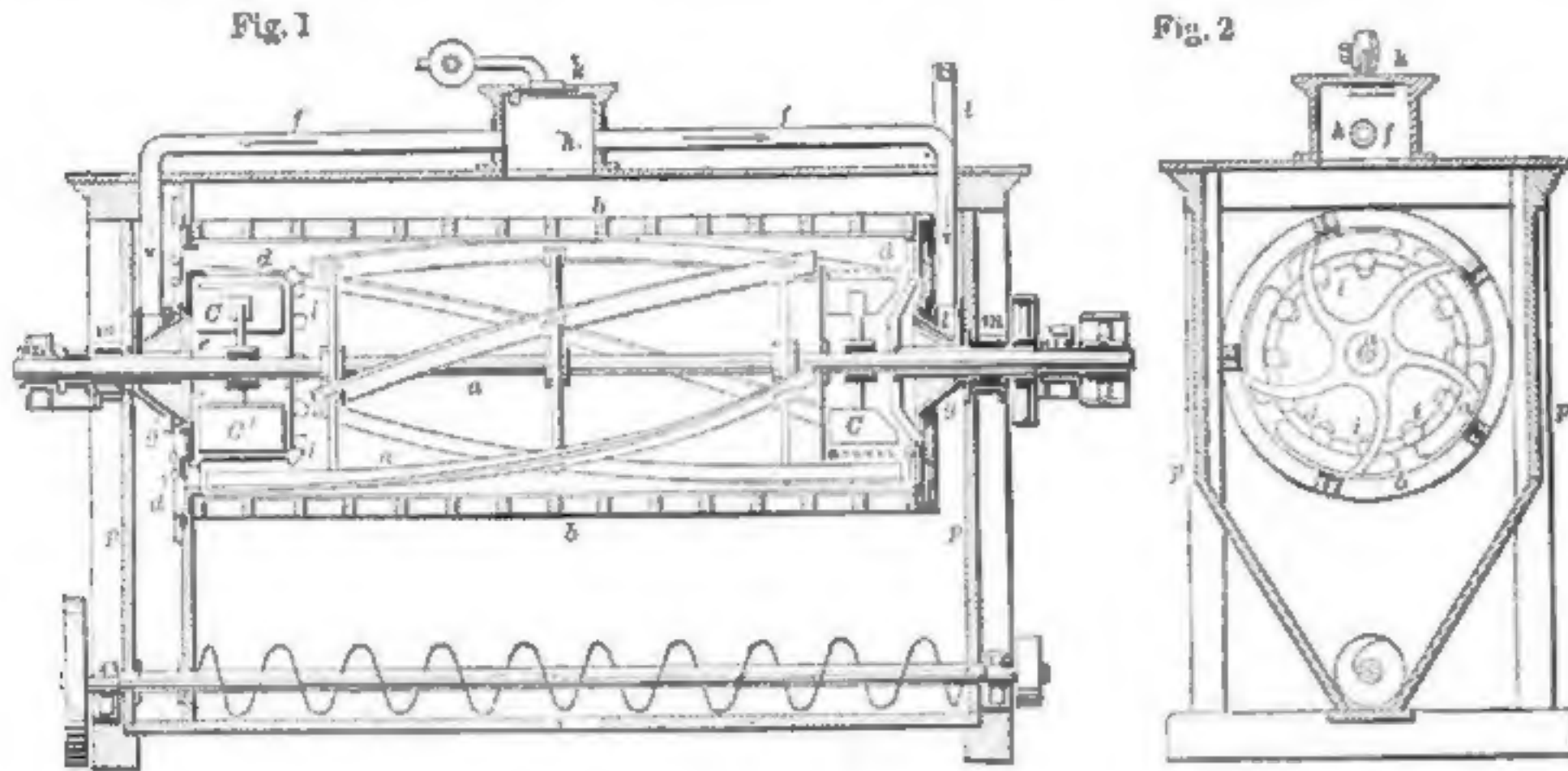
WOLF & HAMAKER, ALLENTOWN, PA.

ON VIEW AT PERMANENT EXHIBITION OF MILL MACHINERY,
36 BROADWAY, NEW YORK.



**FLOUR-BOLTING MACHINE.**

Letters Patent No. 299,647, dated June 3, 1884, and issued to Georg Carl Friedrich Paul Janssen,

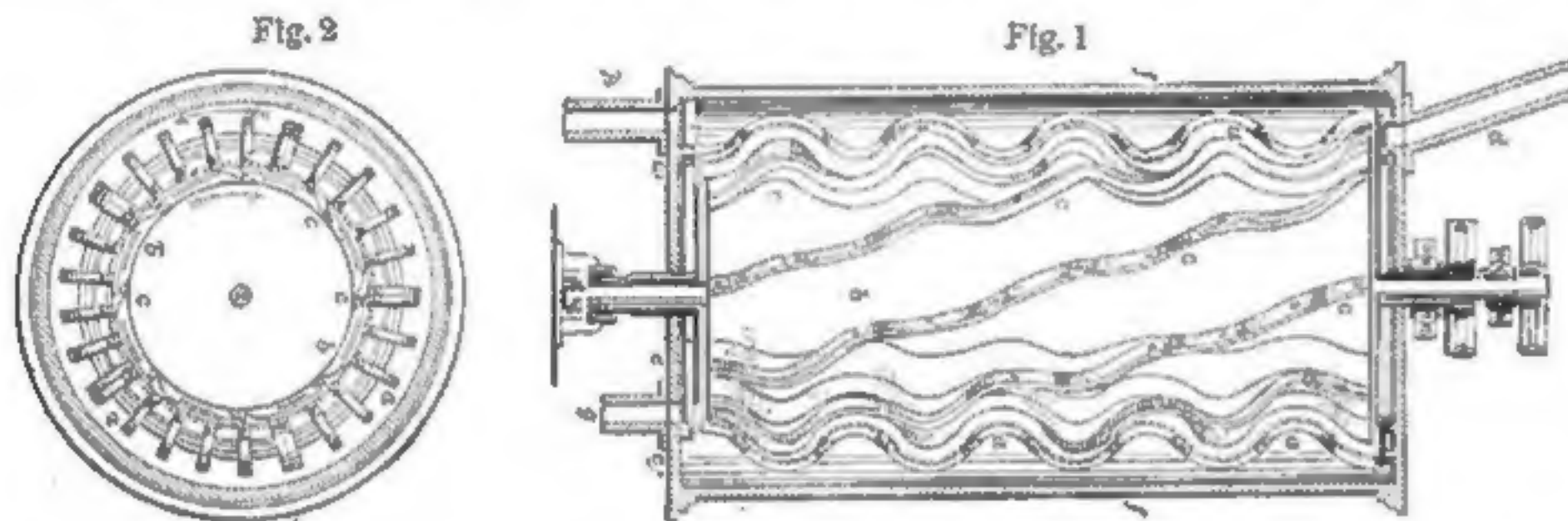
**FLOUR BOLTING MACHINE.**

of Hamburg, Germany. This invention relates to improvements in machines for bolting flour and other pulverized substances, in which the air required for sifting the meal is drawn from the reel-chest inclosing the bolt and circulated through the apparatus, whereby a strong current of air can be applied without loss of material. The invention consists of a revolving reel and interior revolving stirrers, to the shaft of which are applied suction-fans, the frames or casings of which are attached to the heads of the reel. The fan-casings communicate by funnels with air-pipes leading to the

improved flour-bolting machine; and Fig. 2 is a horizontal section on line A B, Fig. 1.

CENTRIFUGAL FLOUR-BOLT.

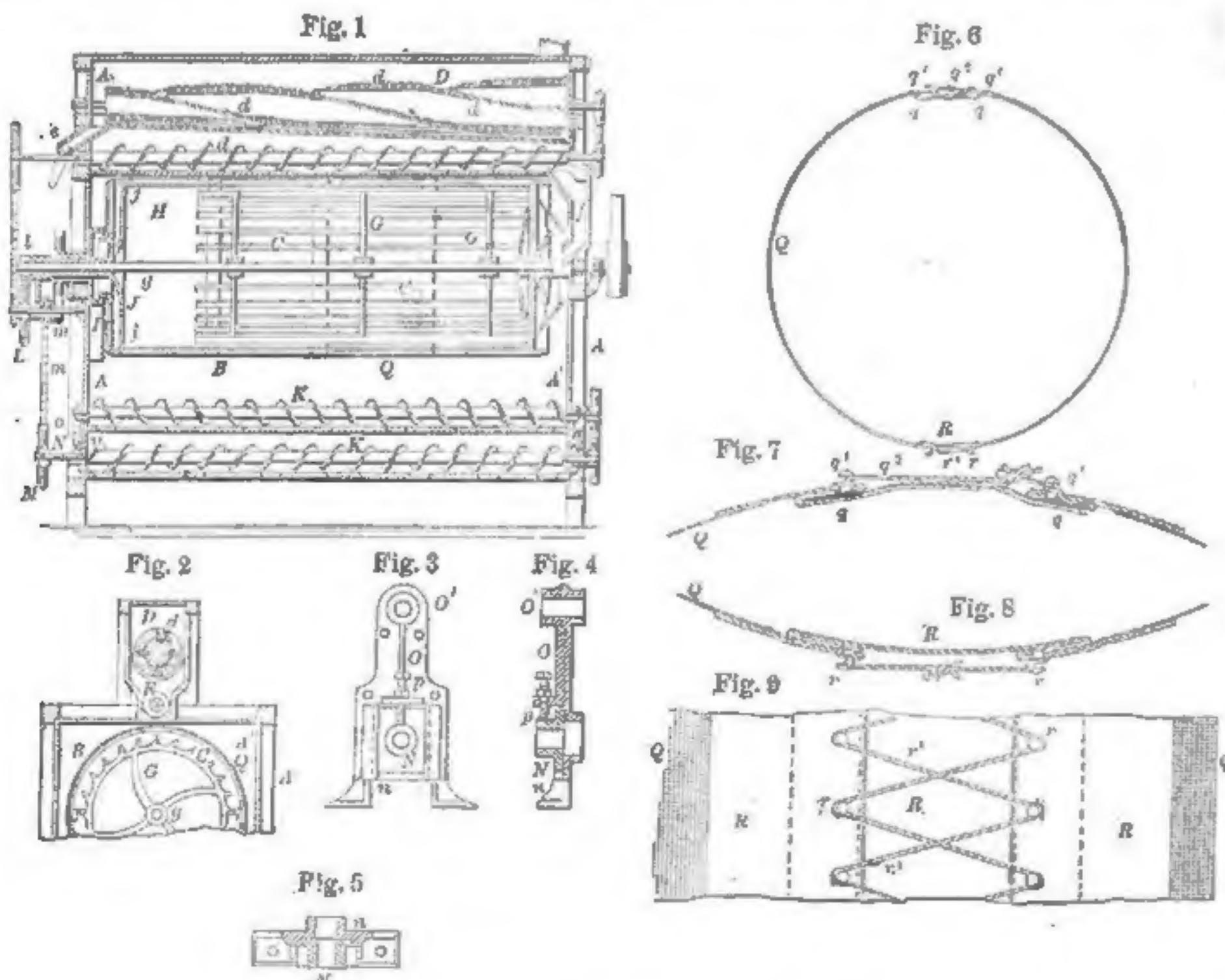
Letters Patent No. 299,784, dated June 3, 1884, to August Heine, of Silver Creek, New York. This invention relates to certain improvements in that class of flour-bolts which are provided with a rotating bolting-cylinder and beaters which rotate in the cylinder, and whereby the material is brought in contact with all parts of the bolting-surface. In the drawings Fig. 1 is a longitudinal

**MACHINE FOR BOLTING FLOUR OR OTHER PULVERIZED SUBSTANCES.**

valved top of the reel-chest, and by supply-openings with the interior of the reel, whereby the circulation of the air through the reel-chest and reel is kept up. In the drawings, Figure 1 represents a vertical longitudinal section, and Fig. 2 a vertical transverse section on line A B, Fig. 1, of the improved flour-bolting machine.

MACHINE FOR BOLTING FLOUR OR OTHER PULVERIZED SUBSTANCES.

Letters patent No. 299,684, dated June 3, 1884, to Louis Johann Friedrich Wilhelm Scharbau,

**CENTRIFUGAL FLOUR BOLT.**

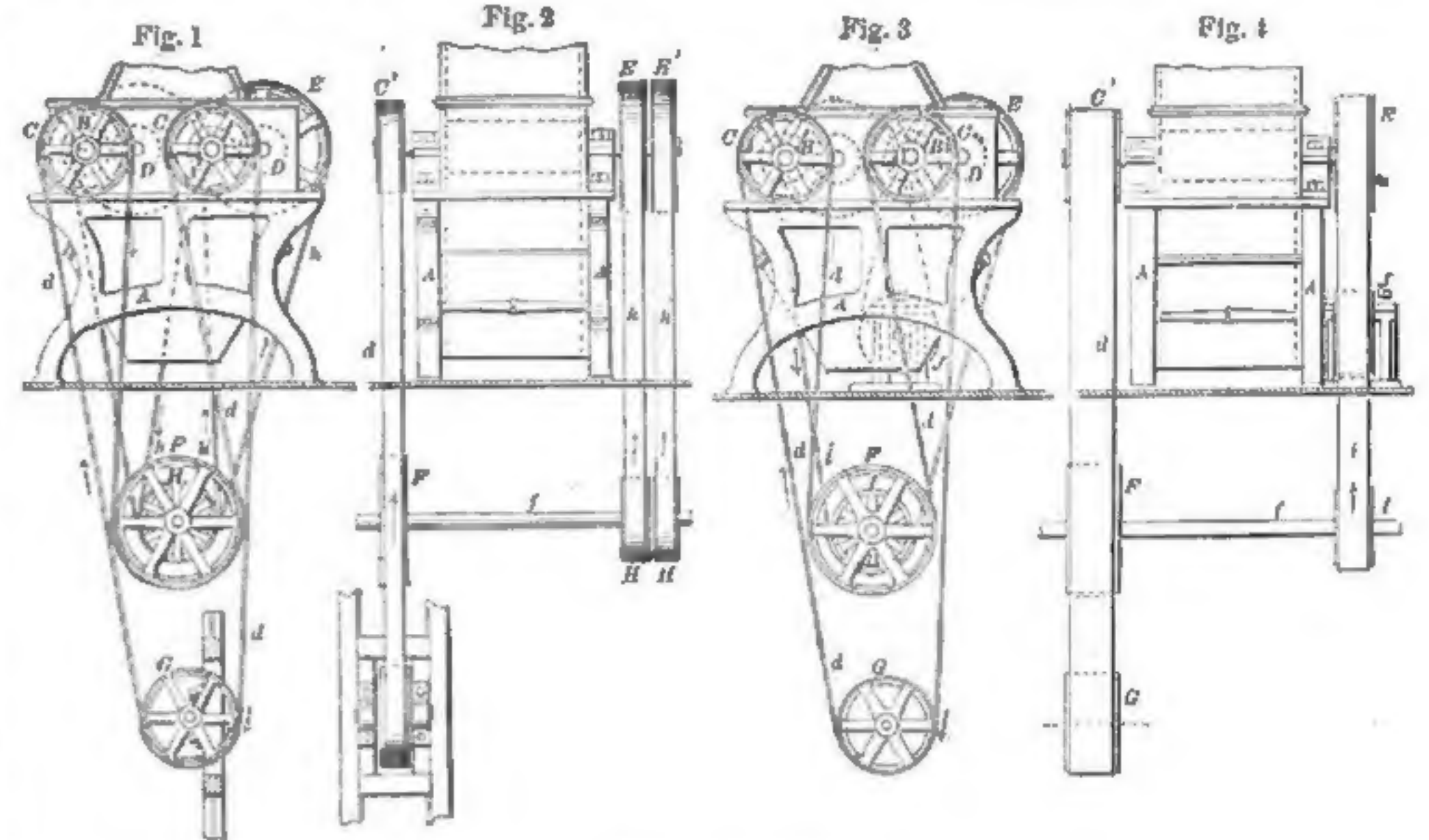
of Hamburg, Germany. This invention relates to an improved machine for bolting flour and other pulverized substances, said bolting machine having a large sifting surface, through which the meal or other pulverized substance is rapidly impelled by centrifugal force; and the invention consists of an interior horizontally-corrugated cylinder having exterior spiral beaters, which cylinder is revolved in opposite direction to a sur-

rounding bolting cylinder or reel having concentric corrugations. The bolting reel is inclosed by a casing or box, which is provided at the top with a supply pipe, which conducts the meal to the space between the interior cylinder and reel, and at the bottom with discharge-pipes that conduct the bolted flour and unscreened portions to the outside. The bottom of the reel is provided with scrapers, which move the flour and meal to the discharge pipes. In the accompanying drawings Figure 1 represents a vertical central section of

ROLLER-MILL.

Letters Patent No. 299,789, dated June 3, 1884, to Noah W. Holt, of Buffalo, N. Y. This invention relates more particularly to that class of roller mills which are employed for grinding grain and similar material, and in which two sets or pair,

of rollers are employed in the same machine. The object of the invention is to simplify the mechanism whereby the rollers are rotated, and consists of the peculiar belt-driving mechanism, whereby the roller-pulleys on both sides of the machine are driven by straight or open belts directly from the driving-shaft without employing intermediate belts and pulleys or a counter-shaft in a roller-mill. In the drawings, Figure 1 represents a side elevation of a roller-mill provided

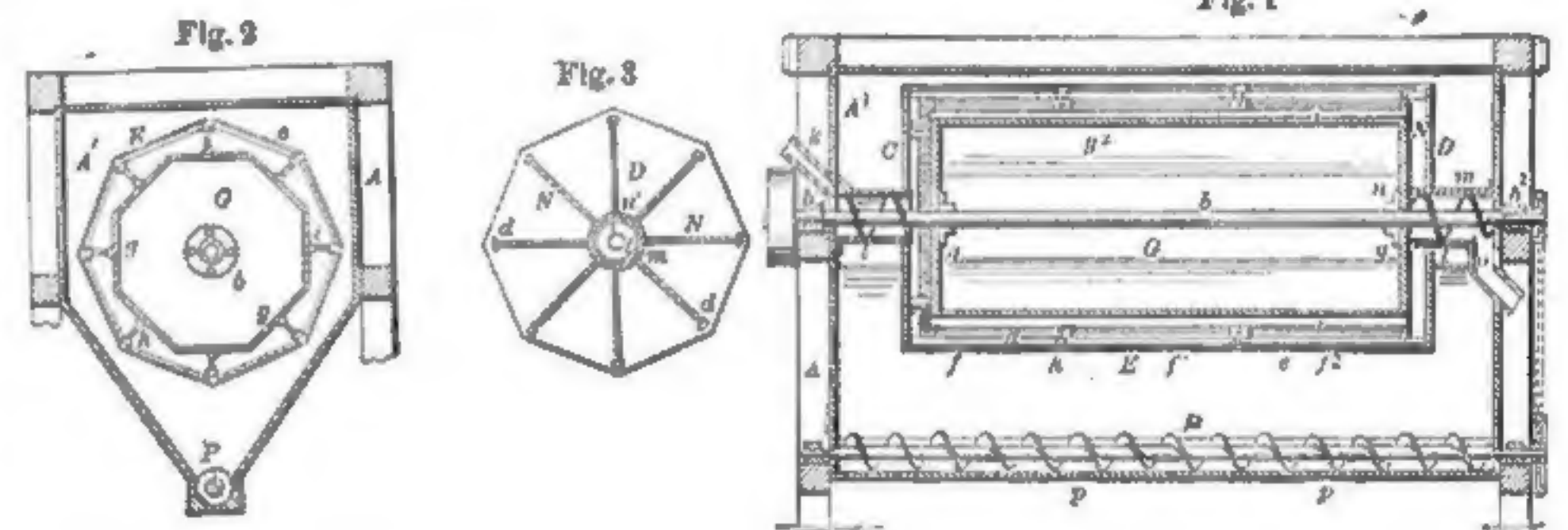
**ROLLER-MILL.**

with improvement. Fig. 2 is an elevation at right angles to Fig. 1. Fig. 3 is a side elevation representing a modified construction of the improved driving mechanism. Fig. 4 is an elevation at right angles to Fig. 3.

FLOUR-BOLT.

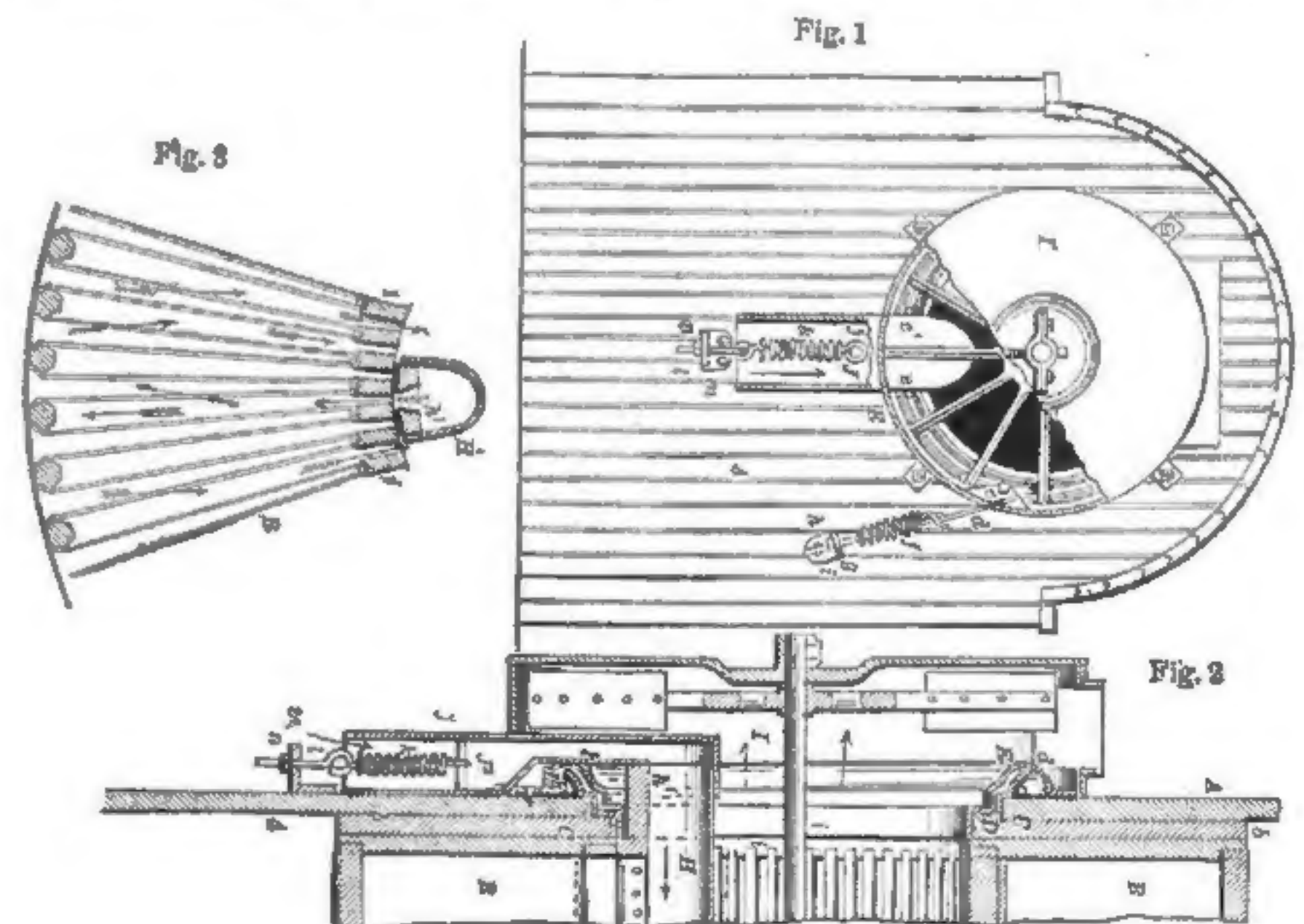
Letters Patent No. 299,790, dated June 3, 1884, to Noah W. Holt, of Buffalo, N. Y. This inven-

ings, Figure 1 is a partly broken end view of the dust-collector. Fig. 2 is a broken vertical section of the same, and Fig. 3 shows in vertical cross-section a portion of the balloon. The object of this invention is to provide means whereby certain working parts of a well-known form of dust-collector are kept in close and air-tight-fitting adjustment, in order to properly operate. This dust-collector has a balloon, B, revolving in a casing, A. In the machine as heretofore constructed this

**FLOUR BOLT.**

tion relates to an improvement in that class of flour-bolts which consist of a revolving reel covered with bolting cloth, through which the material is bolted by the rotation of the reel. In this class of flour-bolts the operation of bolting takes place principally while the material descends, and occurs, therefore, at intervals during the rotation of the reel, so that the latter performs no work during a considerable portion of the time. The object of this invention is to increase the bolting capacity of this class of machines, and to cause the material to be bolted more uniformly and continuously, and to otherwise improve the construc-

inner edge of the opening in the casing A. Inside this ring C is a double L-shaped ring, D, the inner L of which embraces the outer face and inner edge of the central opening in the head of the balloon, in which it is fastened, while the outer L sets freely against the inner face of the ring C and the outer face of the casing A. The outer part of the ring D is extended outward to form a concave molding, wherein is folded the inner edge of the ring F, of felt, rubber, or other suitable flexible material. The outer rim of this felt ring is laid flat against the outer face of the casing A, and is kept in place by screws, which

**DUST COLLECTOR.**

tion of the machine. In the drawings Figure 1 is a longitudinal section of a bolting-reel provided with improvements. Fig. 2 is a cross section thereof. Fig. 3 is a cross section in line x x, Fig. 1.

DUST-COLLECTOR.

Letters Patent No. 299,852, dated June 3, 1884, to William Richardson, of Milwaukee, Wis., assignor to the Milwaukee Dust Collector Manufacturing Company, of same place. In the draw-

also serve to fasten the outer bearing-ring, E, to the same.

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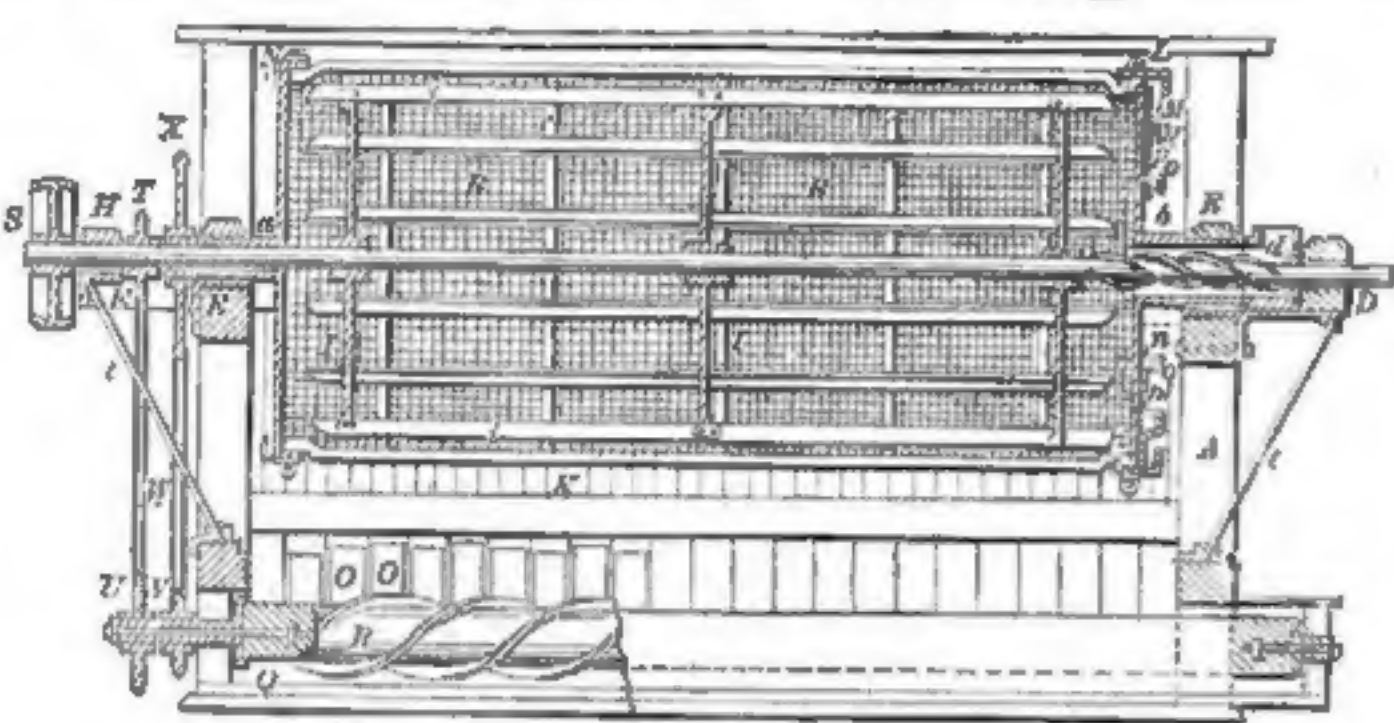
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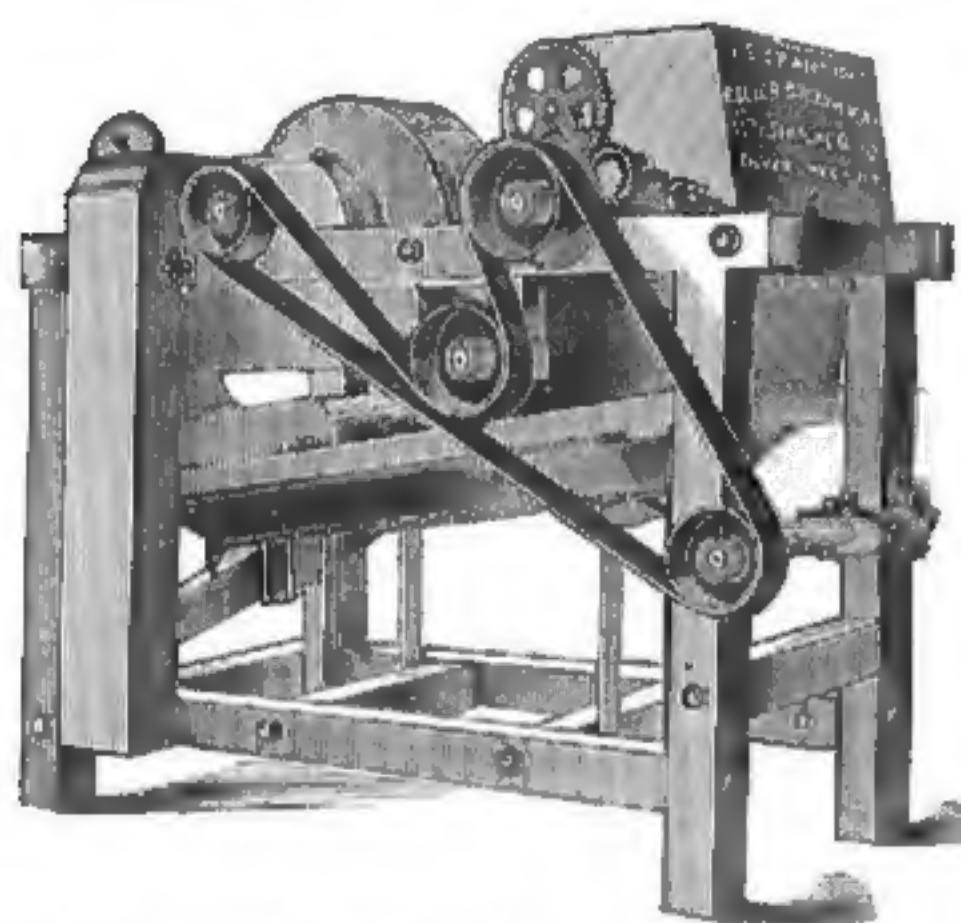
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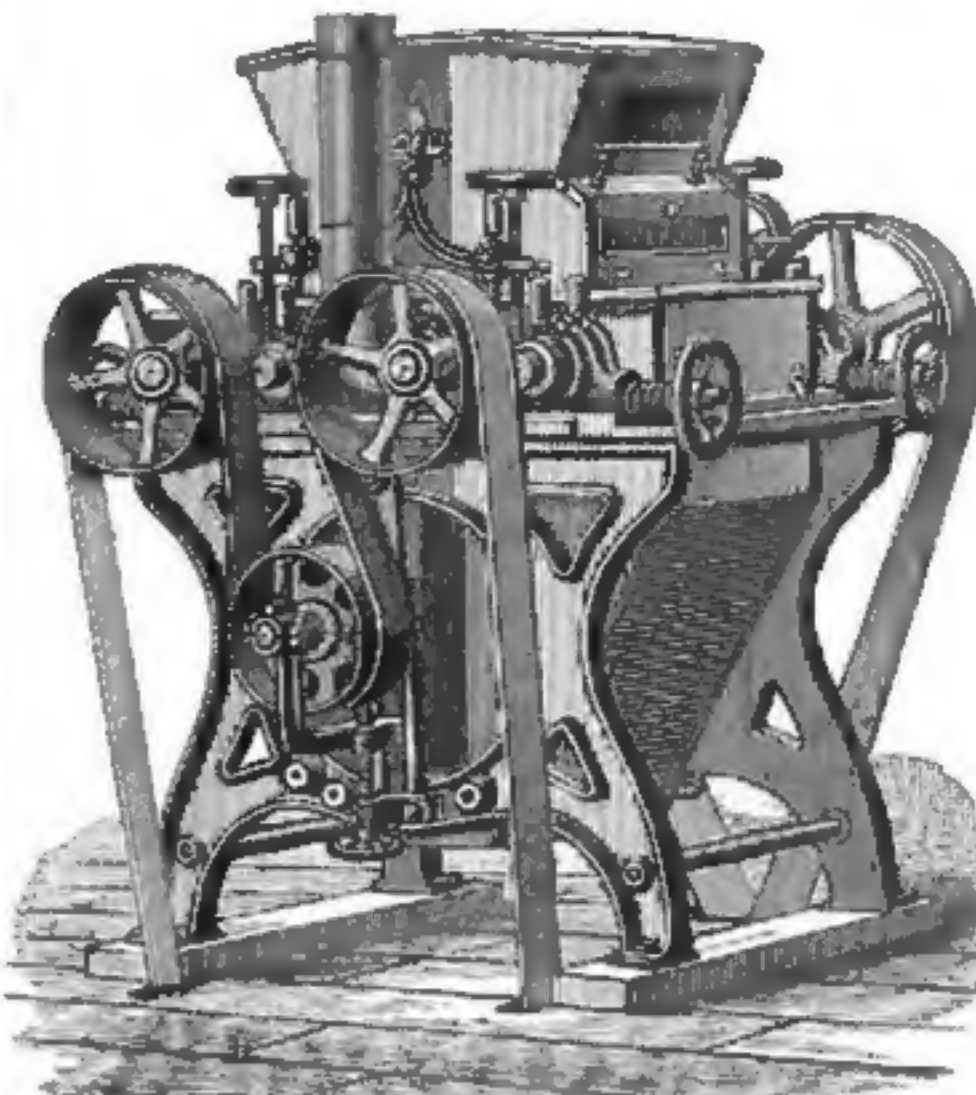
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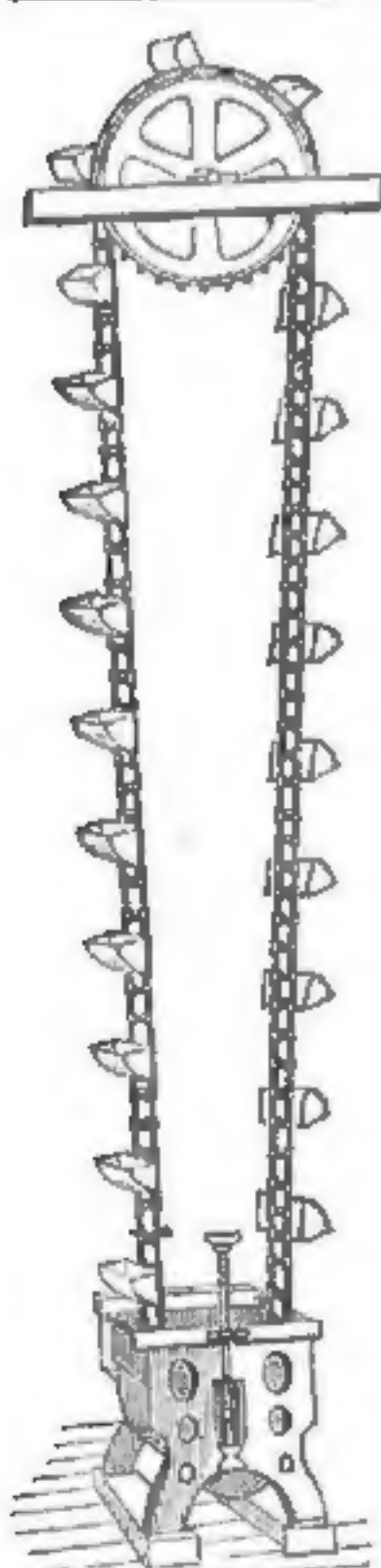
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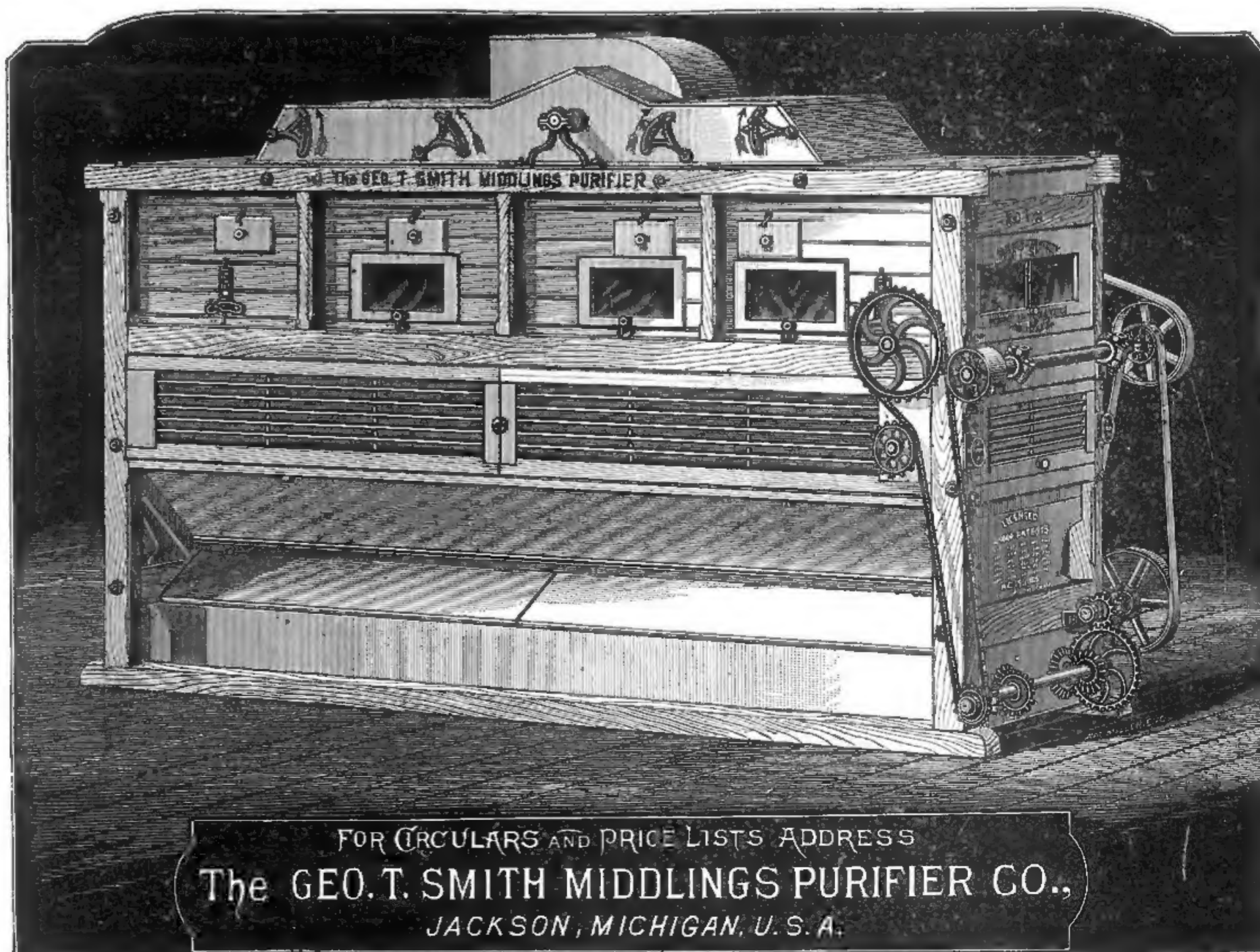
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* * The wild rice sown on the Erie peninsula, Pa., a few years since is growing.

* * Custer county, Montana, has a larger area than the five smallest states of the United States combined.

* * A new geyser basin has been discovered in the Yellowstone valley ten miles south of the petrified forest.

* * The largest school in the world is said to be the Pew's free school at Spitalfields, London, England. It has a daily attendance of over 2,800 pupils.

* * It is estimated that there have been 150 deaths from snow slides in the Colorado mountains this last season. Some railroad towns were blockaded for about two months.

* * The German Society of Commercial Geography is organizing an exhibition of Mexican products, to be held at Berlin, on the plan of the Brazilian Exhibition held there two years ago.

* * The sub-committee of the House Committee on Agriculture reported to the full committee a bill to establish agricultural experiment stations in connection with the various state agricultural colleges.

* * The *Railroad Gazette* for May 23 has information of the laying of track in this country this year upon 885 miles of new railroad. At the same period last year the mileage of new track amounted to 1,460 miles.

* * The New York Board of Fire Commissioners have passed a resolution offering advancement or other reward to any member of the Fire Department who presents to the board within 30 days a working model for the most simple, cheap, and reliable means of casting a life line to the top of a building a distance of not less than 300 feet.

* * Developments and illustrations in sanitary science have everywhere been very marked of late. Following upon the opening of the health exhibition in London, the Prussian ministry of public instruction is now considering the establishment of an institute of hygiene, in connection with the University of Berlin, and Dr. Koch, of the German cholera commission, has been named as the head of the new institution.

* * Arrangements are nearly completed to hold a grand electrical exhibition in Boston the ensuing winter. It is proposed to make the display the most complete in the field of electricity, showing not only the great inventions that are agitating the public mind from day to day, such as electric lights, telegraph, telephones, etc., but to make it almost the most exhaustive in the less-known branches, and in the thousand and one articles that owe their existence in part or wholly to developments in the electrical science.

* * A French engineer in Brazil has lately been selected to construct what will probably be, when completed, the largest dam in the world. The dam will be 940 feet long by 58 feet high, and two smaller ones will close side depressions. This work will, it is calculated, back the water over 1,500 acres, and retain 14,000,000,000 cubic meters of water, sufficient to provide for all the cattle of the regions during three years,

and for the irrigation of 5,000 acres of flat bottom land alongside the river bed below. The rivers of Ceara flow in the wet season alone.

* * It is encouraging to learn from the report of the annual meeting of the American Fish Cultural Association, that in spite of the employment of 85,000 men and \$30,000,000 of capital in supplying table fish to the market, and a large fleet of steamers and 2,000 men in the Menhaden fisheries, with the exception of striped bass and lobsters, all kinds of sea fish are as abundant as they were fifteen years ago. Immense as the fishery business is, its possibilities have not yet begun to be developed.

* * The desert of Sahara, Africa, a part of which it is now proposed to flood, covers an area of 2,000,000 square miles, equal to about three-fourths of the United States and territories. The proposed flooding, the canal for which has been authorized by the Bey of Tunis, will, however, only cover about 126,000 square miles, equal to the states of Ohio, Indiana and Illinois, and that section is broken by several spots of high ground that will appear as islands. The result of the introduction of such a lake or sea in a hitherto barren country can not yet be definitely stated. It is thought, however, that it will cause great climatic changes that will extend even into Europe.

* * The greatest whispering "gallery" in the world is that of the Grand Canyon, Colorado. For years this chasm has been a matter of surprise to prospectors and miners on account of its wonderful transmissions of sound, and it has only been since the advent of the railroad that any definite idea has been entertained of the great distance sound travels within its walls. A train of cars crossing the bridge at the Needles can be plainly heard on a quiet day at Cottonwood Island, a distance of eighty-four miles. The fife and drum at Fort Mojave is distinctly heard at Bull's Head, a distance of eighty-four miles. The report of the sunrise gun at Fort Mojave can be heard at El Dorado Canyon, a distance of ninety-six miles.

* * According to a report sent by Lieut. Frederick to the *Moscow Gazette*, there will soon be no Kamtchatkans left in Kamtchatka. The population in a district larger than the whole of France, which was once above 50,000, had in 1880 fallen off to 6,200. The only occupations of the inhabitants are shooting and fishing; their food consists almost exclusively of fish, for the annual income of any one rarely exceeds \$4, for which not forty pounds of flour can be bought. On the western coast things are even worse. The mortality in these parts is even greater than in the east. On the Commodore Islands, however, which are separated by a distance of less than 200 miles from Kamtchatka, the population is flourishing again under the benevolent supervision of an American firm.

* * An English statistician has discovered once more the curious fact that the consumption of coffee in Great Britain has been steadily declining for more than a quarter of a century. This is contrary to the experience of almost all other countries, but the English are becoming a tea-drinking nation. The consumption of tea has increased more than 200 per cent. in forty years—from 1.47 to 4.62 pounds per head annually—while that of coffee has sunk from 1.37 to .89 of a pound, and is still declining. The compiler of these statistics attributes the growing disuse of coffee to the increasing difficulty of getting the pure article, and the moral is one that should be heeded by the American dealers, who are frightening people out of its use by employing danger-

ous coloring materials and by other such devices.

* * A writer in the *Journal des Economistes*, M. de Molinari, calls attention to the fact—which he afterward proves by figures—that, "of all the articles of consumption," government is unquestionably the one of which the price has increased the most of late years, and this "without any visible improvement in the quality of the article." The public expenditure in France was, he states, 1,014,000,000 francs in 1829, the last year of the restoration government. At the close of the July monarchy in 1847 it rose to 1,629,000,000. In 1869 the figures were nearly doubled, while in 1876 the ordinary budget amounted to 2,570,000,000, to which must be added the total for extraordinary expenditure. For the coming year 1885 the ordinary budget is estimated at 3,048,000,000, and though what may have to be reckoned for extraordinary expenses is as yet unknown it will certainly not fall short of 1,000,000,000. He proves, in fact, that, what with extraordinary public-works expenditure, extraordinary outlay for the army and navy, the cost of a colonial expansion policy which necessitates distant expeditions, the budgets, ordinary and extraordinary together, far exceed in the present day 4,000,000,000 francs; so that, to quote his words, "the price of the article, government in France, has increased fourfold in little more than fifty years."

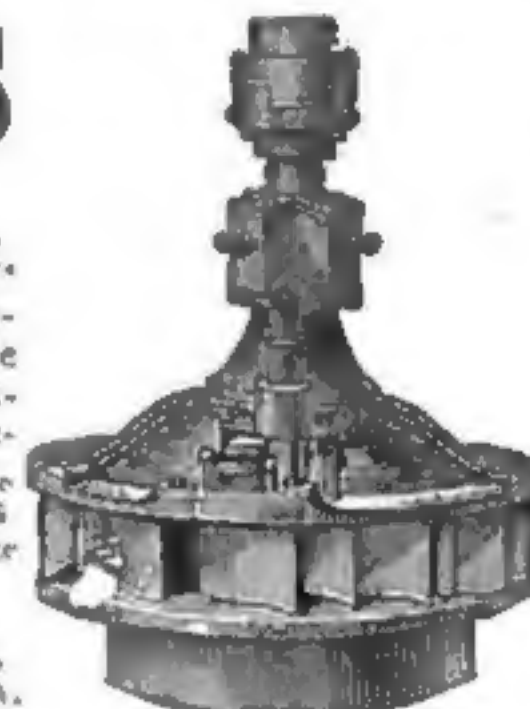
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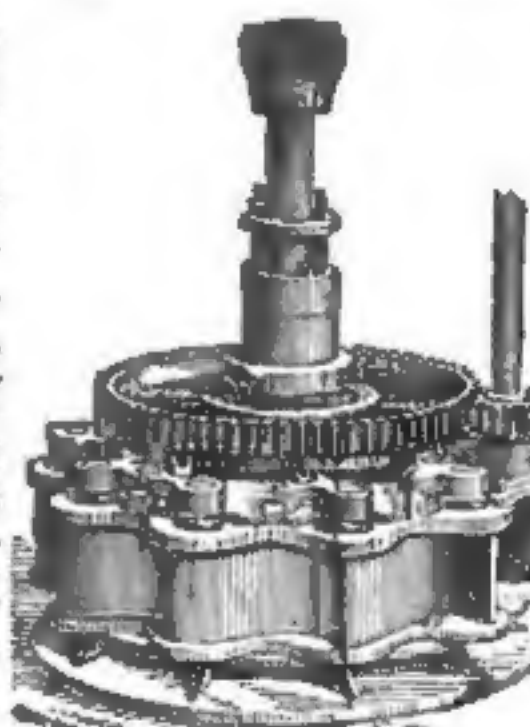
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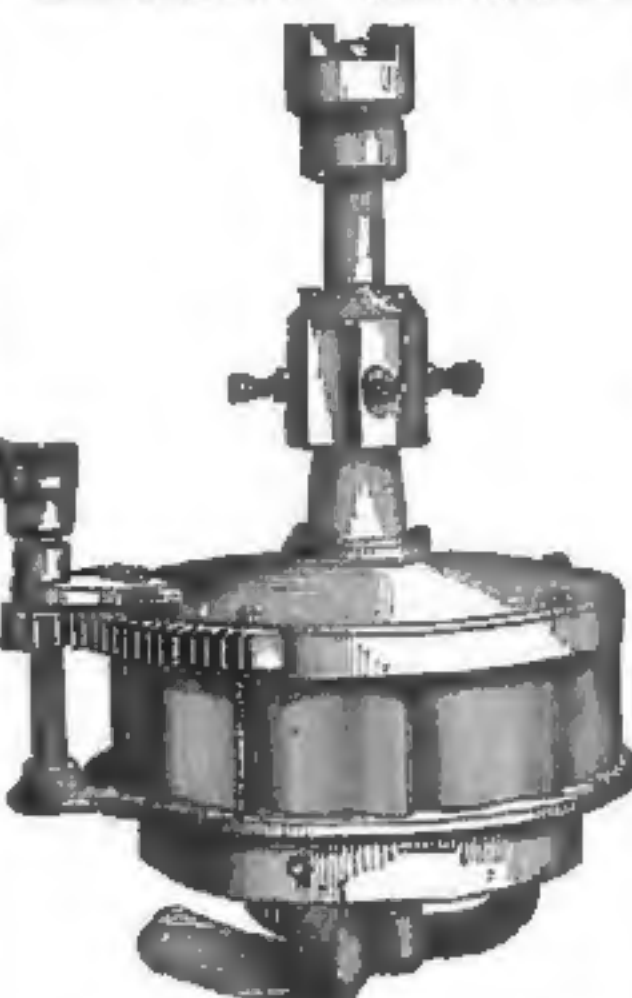
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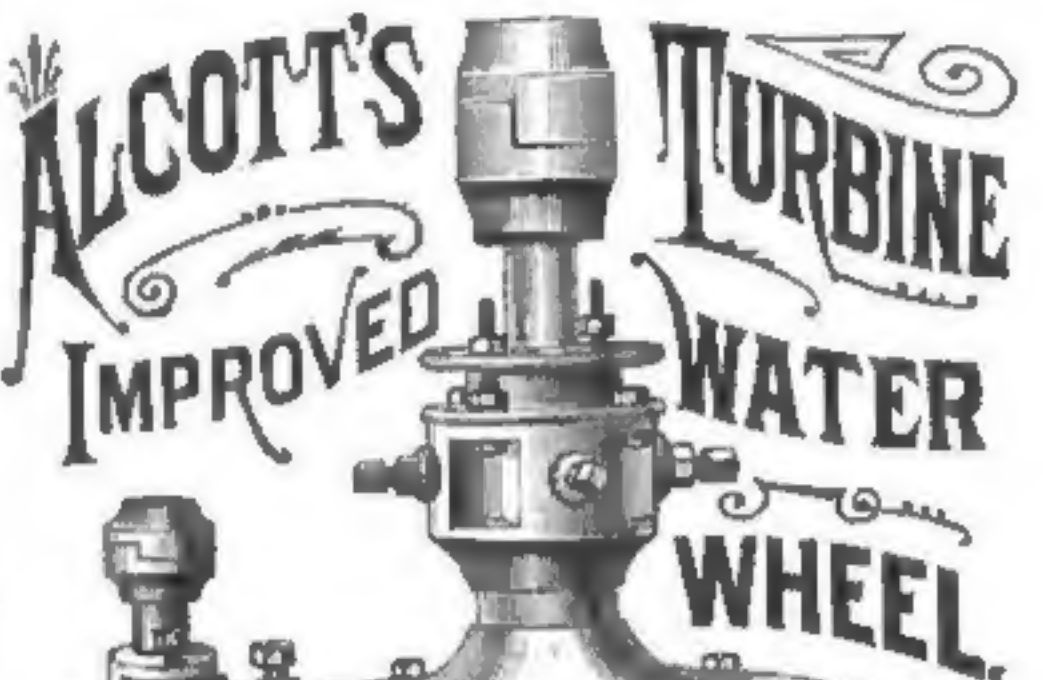
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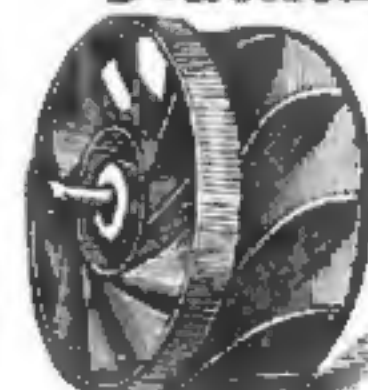


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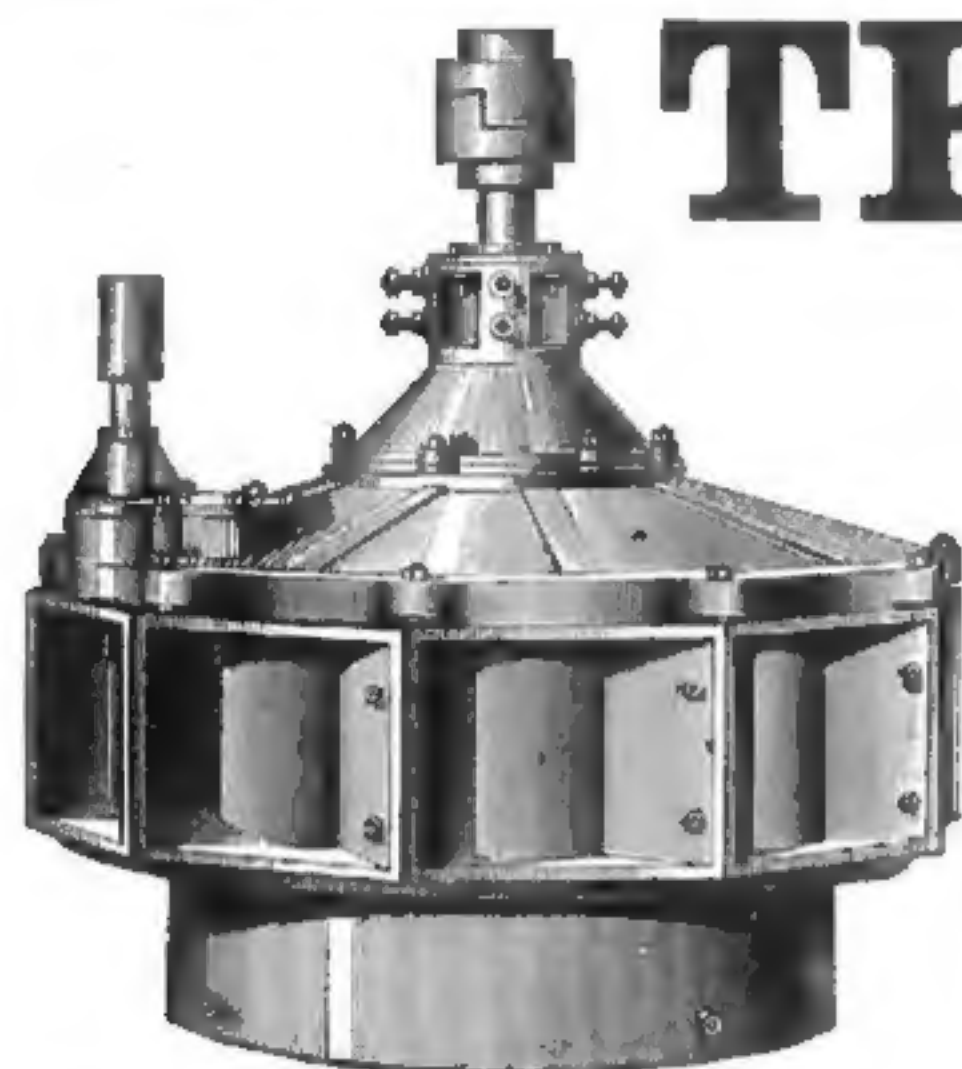
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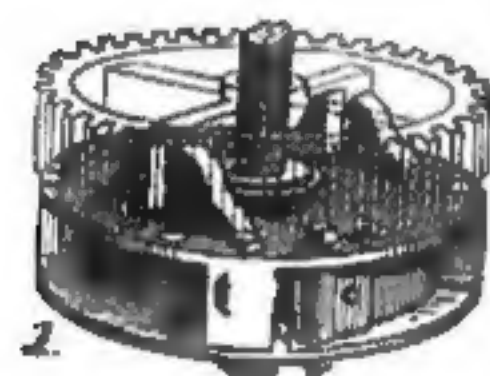
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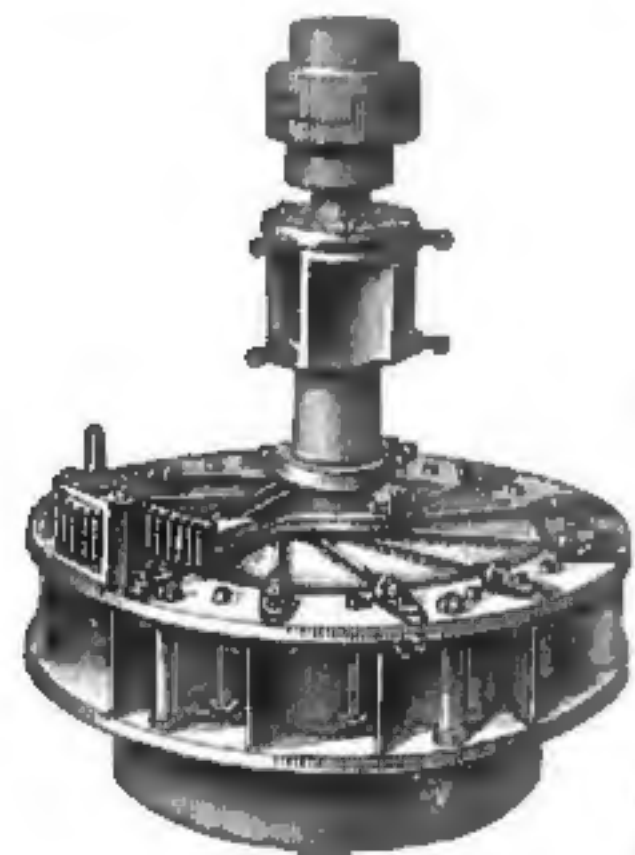
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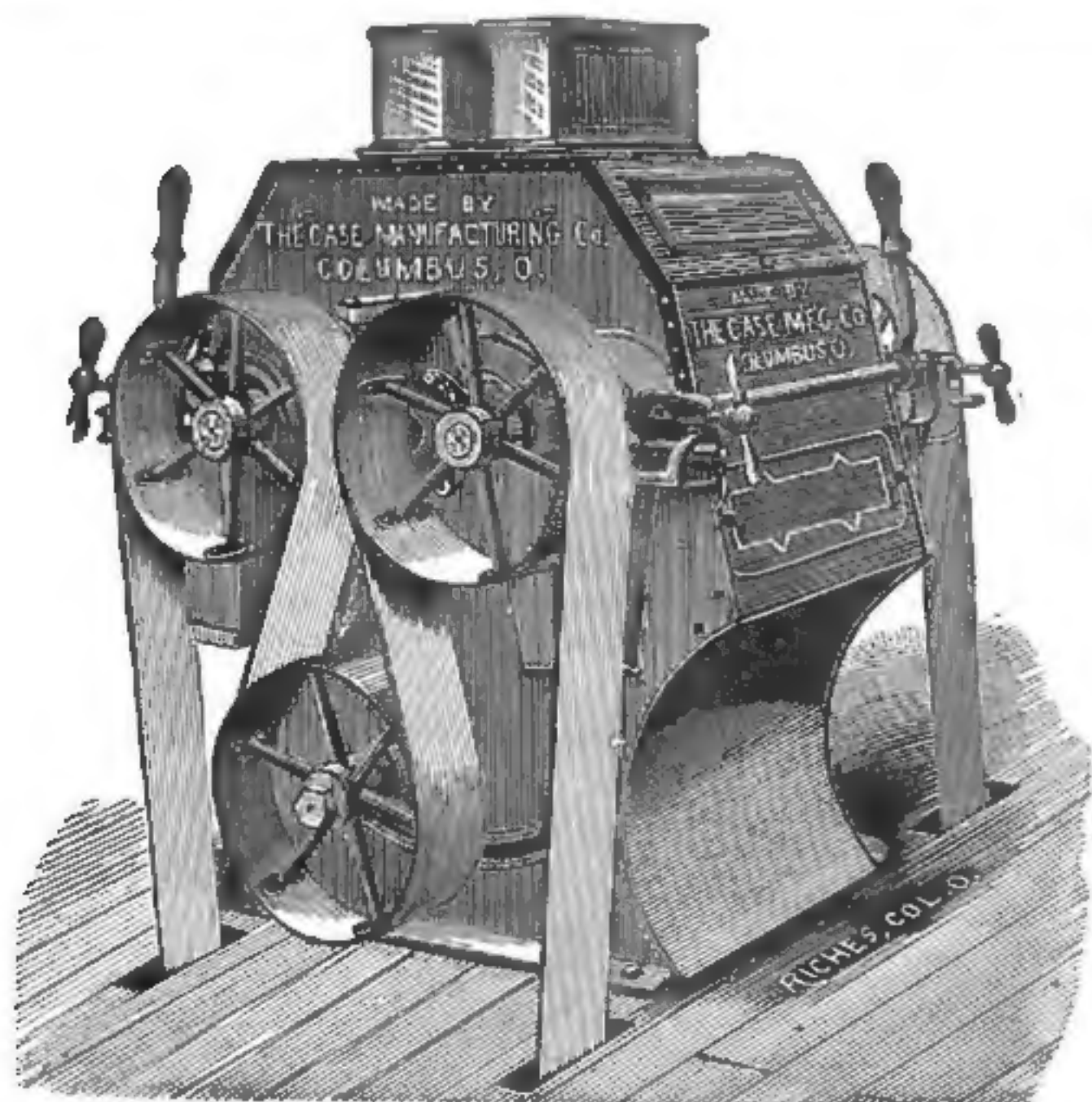
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OUR MINNEAPOLIS LETTER.

[From our own correspondent.]

DULL TIMES WITH THE MILLERS—LOW PRICES FOR WHEAT—CURTAILED OUTPUT—THE HEAD MILLERS' EXCURSION—CHANGE IN, AND SHUT DOWN BY THE MINNETONKA MILL COMPANY—ELECTION OF WHEAT INSPECTOR AND WEIGHER—OPENING OF THE NEW CHAMBER OF COMMERCE—NOTES AND GOSSIP.

The present time is a very dull one with our millers, there being scarcely any life to the flour trade. Those having orders ahead have got them filled, and the mills are working on the business coming in from day to day. While stocks at central points are reported comparatively light, leading to the expectation of an impetus to the demand, buyers are slow to take hold, and thus the market is a weak and dragging one. That such a condition of affairs should continue to exist has been a great surprise to many of our millers, who had counted on a favorable market by this time. But, notwithstanding the absence of any life in the business, millers show a certain firmness and a determination to maintain prices where they are, preferring to shut down rather than to make any concessions. They believe that old wheat flour must come into better demand as the crop year draws to a close, and are not without faith that flour may yet be made this year with a profit. Some think that they can discern favorable signs in more frequent inquiries from abroad, while at the same time the home trade is slightly on the increase.

The low prices at which wheat rates is a matter not pleasantly contemplated by the millers here, the majority of them, anyway, who are members of the association. This class have considerable quantities of wheat on hand which has cost them much more than they can go into the market and buy it for now. It is conceded that to buy wheat on the present market and make it into flour, there is room for a small profit. But good hard milling wheat is claimed to be scarce, and those having holdings argue that it will command a premium before many days, when they will profit by their early purchases.

The mills of the city do not vary greatly in their operations. Out of the whole number of twenty-two, there are three, the Excelsior, Zenith and Palisade, which are almost steadily idle, while one to three of the others are found shut down nearly every week. That leaves about sixteen mills in operation on an average. This number produces not far from 100,000 barrels of flour per week. During the past ten days the Washburn and Pillsbury mills have been known to be exporting largely.

The stock of wheat here does not fall away very fast in volume, notwithstanding that the mills use about 55,000 bushels per day. But this is because the receipts have been extremely large, not unfrequently equaling the amount ground. The amount in store in elevators here now is 1,950,000 bushels. At St. Paul the stock has lately shown quite a decrease, at the present time amounting to 350,000 bushels.

The annexed table shows the receipts and shipments of Minneapolis for two weeks:

FLOUR.		
	Receipts.	Shipments.
	Bbls.	Bbls.
June 3,	625	91,993
June 10,	1,000	124,602
Total	1,625	182,671
WHEAT.		
	Receipts.	Shipments.
	Bus.	Bus.
June 3,	401,000	28,000
June 20,	465,000	31,500
Total	866,000	59,500

The Head Millers' Association has made elaborate and extensive preparations for its fourth annual excursion to Lake Minnetonka, on June 21. Five thousand tickets have been printed, and they are selling very fast, already giving assurance of an extremely large crowd. The association has started a fund for the erection of a monument to the memory of those millers losing their lives in the great mill explosion in 1878, and will add the proceeds of the excursion to this fund. Every preparation has been made for the pleasure and comfort of those attending, as well as for a great deal of fun and sport. The exercises at the lake include a game of base ball between nines from the Pillsbury and Washburn mills, and a sack race in which the head millers are to participate.

The millers charter the palatial steamer, Belle of Minnetonka, and place it at the disposal of the party all day. Ample provisions will also be made for dancing, and the affair promises to overshadow anything of the kind ever attempted. Round trip tickets are \$1, and neighboring millers are cordially invited to join their Minneapolis brethren in a day of sport and pleasure.

A change has occurred in the Minnetonka Mill Company, of this city, operating the mill at Minnetonka, Minn. H. Williams, who has been vice president, and acted as head miller, goes out, and the mill has been shut down until fall. Mr. Williams was the first head miller on the Falls, having charge of the old Island mill at a very early day, and afterwards of the Cataract mill, now the oldest mill standing in the city. Matt Walsh, who succeeded to the charge of the Cataract, is now county treasurer, and Charley Hoit, who is the ruling spirit in the Pillsbury A, commenced their trades under Mr. Williams. At one time Mr. Williams was a man of considerable means, but lost largely in the milling business in southern Minnesota, and now, while a man of advanced years, finds it necessary to resume the use of the pick by which to gain a livelihood.

On the 11th inst. the Chamber of Commerce elected its wheat inspector and weigher, whose offices expire Aug. 1. For inspector, J. S. Crandall, of Milwaukee, and Kinsey Maxfield, the present incumbent, were candidates. The latter was re-elected by 150 to 37. The most interest was centered in the choice of weigher. C. A. Cornman, who holds the office at present, having Geo. H. Conant, his deputy, as an opponent, the same as it was last year. Conant is the practical man, and was elected, though only by the slender majority of five. His business is the weighing of wheat at the mills, and he is decidedly the choice of the millers.

The formal opening of the Chamber of Commerce building occurred on the 5th inst. and was an affair that our citizens are justly proud of. The handsome and spacious building was crowded with a representative throng of people, supplemented with a liberal sprinkling of guests from neighboring cities. The Minneapolis Chamber of Commerce was organized Oct. 19, 1881, and to-day has a membership of 538, and a \$175,000 building standing upon a \$50,000 site, and is destined to become a mighty factor in the commercial world. Membership tickets of the Chamber are now selling at \$380.

The paper mill between the Excelsior and Northwestern mills, caught fire a few days ago, and the roof and inside were burned considerably. In putting the fire out the Northwestern suffered somewhat from water, the damage being between \$1,000 and \$1,500. However, it was shut down only three or four days in consequence.

A suit has been commenced by J. D. Edge, millwright, against Sutton & Lovejoy, millers at Osceola, Wis., to recover \$7,000 which he alleges is the unpaid balance due him for building their mill. The case comes up in the September term of the Circuit Court.

Geo. Chesbro, not getting along very well with the proprietor, has given up the Simmer mill at New Prague. But George left the mill making a first-class flour, and a good record as a miller behind him. Geo. H. Kempton, late of the Palisade, took his place at New Prague.

There is a paper barrel on exhibition at the Pillsbury A mill, made somewhere in the east. The barrel seems strong and durable, but it looks as though it would cost too much to make its extensive use practicable.

J. S. Leas, of the Barnard & Leas Mfg. Co., was around the fore part of the week, and reports the distribution of Davigro rolls among the "heathen" as going gloriously on.

The elevators at Neche and Bathgate, Dakota, owned by Moore, Thorne & Co., have been purchased by the Northwestern Elevator Company, of this city.

Mayo & Collins, successors to Chisholm Bros. & Gunn, have dissolved partnership. Mr. Collins retiring and Mr. Mayo continuing the business alone.

Thos. L. Clark, head miller of the Lincoln mill at Anoka, was married in Minneapolis on the 5th inst.

The report is current here that Al. Mowbray, the Winona miller, has retired from the Winona Mill Co.

Wm. McLean, of the Richmond Mfg. Co., has been in town several days.

Barrels are selling here now at 37 to 40 cents. Minneapolis, June 14. CALEB.

Notes from the Mills.

Brookings, Dak., is building a \$50,000 flouring mill.

Work is progressing rapidly on the flour mill at Blunt, Dakota.

The Case Mfg. Co., Columbus, Ohio, have lately received an order from James Jones, Thorold, Ontario, for three pairs of rolls.

Fitzsimmons & Krieder, Jacksonville, Ill., have lately ordered a patent automatic feed for their rolls, from the Case Mfg. Co. Columbus, O.

The Case Mfg. Co., Columbus, Ohio, have an order from W. Braley, Centerville, Ia., for two pair of rolls with patent automatic feed.

In Dakota, we are told, the farmers are plowing by steam at a cost of less than \$1 an acre. The motor is a very broad-wheeled traction engine.

Commins & Allen, Akron, Ohio, have contracted with Allis & Co. for additional roller mills to increase their capacity, also for a Reynolds-Corliss engine.

Work has commenced upon a 30,000 bushel elevator for Pillsbury & Hurlburt, at Devil's Lake, Dakota. Over half a million bushels of wheat will be marketed there this fall.

Luney Bros. & Co., Denison, Iowa, have contracted with Allis & Co. for eight pair Allis rolls in Gray's noiseless belt frames, and other machinery to refit their mill to the roller system.

The Nashua Water Power Co., Nashua, Iowa, have contracted with Allis & Co. for the outfit necessary to place their mill on the roller system, including ten pairs of Allis rolls in Gray's noiseless belt frames.

Geo. Crossley & Son, of Princeton, Ill., have contracted with Allis & Co. for a No. 2 four break reduction machine, a Gray's noiseless belt roller mill, and machinery to equip his mill on the roller system.

M. C. Whitehurst, Canal Winchester, Ohio, has contracted with Allis & Co. for twelve pairs Allis rolls in Gray's noiseless belt frames, and special machinery necessary to equip his mill on the roller system.

The Case Mfg. Co., Columbus, Ohio, shipped A. B. Childs & Son, London, England, one No. 1 double, and one No. 2 single purifiers, and one 3-break machine, all supplied with the Case patent automatic feed.

The new roller mill at Mitchell, Dak., began work the first of the month, and is turning out 100 barrels of flour per day. There is enough wheat in the warehouses in the neighborhood to keep the mills running till the new crop comes.

Wheat is being sent to market according to reports, in the southern parts of the state of Minnesota in spite of low prices, in order to raise money for taxes, and in many cases farmers who have held for a higher price are selling at a sacrifice.

On June 12 William M. Smith, proprietor of the Moawequa flouring mills, at Moawequa, Ill., made an assignment to Valney Snyder and R. A. Patton. Liabilities about \$6,000. The mill will be run in the interest of the creditors. It is said the assets will cover the indebtedness.

Near Canton, Dakota, June 6, the Beloit mills comprising one large four-story grist mill, and one woolen mill, was destroyed by fire. The fire was of incendiary origin. Loss, \$20,000, with no insurance. The property is situated two miles below Canton, on the Iowa side of the river.

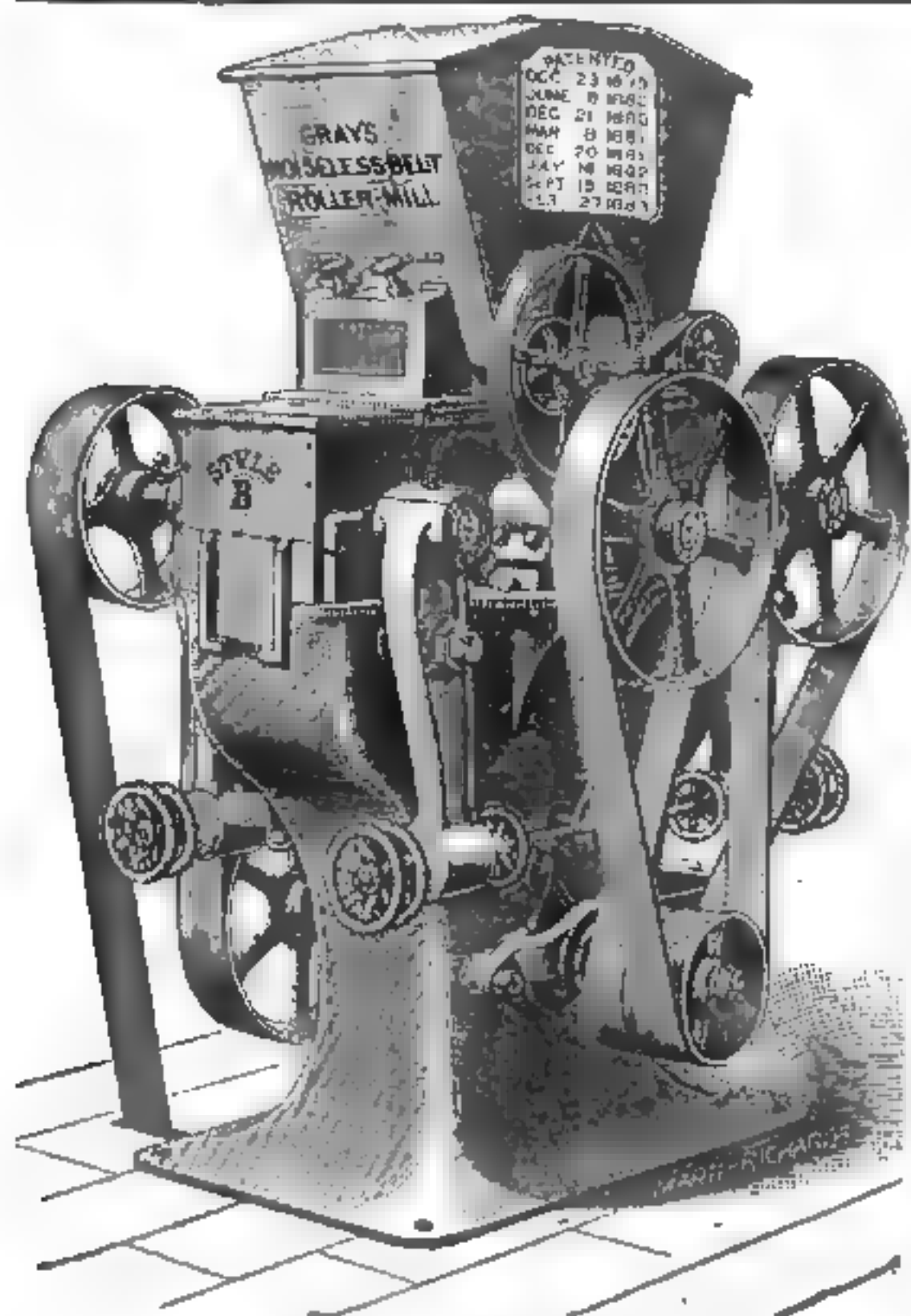
Willford & Northway, of Minneapolis, Minn., have ordered of E. P. Allis & Co. a Gray's noiseless belt roller mill for the DuQuoin, Ill., Mill Co.; six pairs Allis rolls in Gray's noiseless belt frames for Nelson Story, Bozeman, M. T.; one for E. D. Munger, Kilbourn City, Wis.; one for Klaus Fox & Co., Jamestown, D. T.; one for W. H. Maes, Brookings, D. T., and eight pairs for Wheeler & Rodgers, Wyocena, Wis.

C. B. Maurer, who has for seventeen years past been manufacturing barrels, staves, etc., on South High street, in Akron, Ohio will go out of that business at the end of the year, at which time all his contracts with mills in that city will expire. He will commence immediately to break ground on his land one-half mile west of Tallmadge, and where he owns 800 feet front on the N. Y., P. & O. R. R., for a 150 barrel flouring mill to be equipped with the roller process. The contract has been let to Nordyke & Marmon Co., of Indianapolis, who will have the mill in operation by November 1st. Mr. Maurer has made a contract with the N. Y., P. & O. R. R. for a switch to be built upon his land. Although the mill is a few miles from Akron, it will be as much of an Akron institution as though it was located in that city, as Mr. Maurer will brand his goods from Akron and will do all of his business there. The name given to the new concern is "The Daisy Flouring Mill."

A correspondent of the Pioneer Press, St. Paul, Minn., writes: There is not a town in Dakota that is not anxious to get a flouring mill, and there is not a town that is not willing to give a bonus of from two thousand dollars upward to secure such an industry. While I am not suf-

ficiently well informed to give advice on this subject, and to adduce facts and figures to show that these enterprises will always pay, there is, no doubt, plenty of business in Dakota for a large number of mills. As the country settles, the consumption of flour increases, and the local demand is not an unimportant factor in striking a balance. In many sections of the territory there has been more or less complaint against the elevator men for ungrading wheat, and against railroads for not affording shipping facilities at the same rates given the grain buyers. As farmers are generally dependent upon the elevator men, and, as millers are able to make satisfactory rates for shipping flour, the benefits of mills to farmers become apparent. Another thing that farmers in all sections need is a mill that will do custom work. In Southeast Dakota many farmers aim to raise only enough wheat for their own consumption, but it is generally a difficult matter to get the grists ground. In a word, it would seem that of all the business openings in the great territory, the chances for putting in small mills that can do first-class work are the most promising. Skillful millers who are foot loose and who can command a few thousand dollars, are scarce, and when one of our enterprising Dakota towns hears of a good man, it makes an offer of such a bonus that the temptation to locate immediately is hard to resist. Mills are now building in a number of towns, and many more are holding out inducements to millers.

The Jackson, Mich., *Patriot*, in its issue of June 8th, devotes a column and a half to the works of the Geo. T. Smith Middlings Purifier Co. With most of the matter contained in the article our readers are already familiar, so that we shall simply make a few extracts that may prove of interest as showing the degree of prosperity which attends the company, as well as indicating one or two commendable features of discipline among its employes, which, while costing very little, if anything, may, some day, prove in the highest sense of value. The paper says: Some idea of the size of this industry may be gleaned, when it is known that its ground area is 85,000 square feet, on which rise buildings from three to four stories in height. But even this immense working space has been found insufficient and the foundations are nearly completed for an additional building, 60x85, and four stories in height. In this will be placed the enormous engine—by far the largest in our city—of 350 horse power, built by E. P. Allis & Co., of Milwaukee, Wis., and which has a 48-inch stroke, with a balance wheel 34-inch face and 16 feet in diameter. The balance of this large addition will be devoted to the heavier kinds of work, and storing purposes. Many other, though minor improvements are also in the course of erection. A salient feature of this great industry is the complete and effective system that can immediately be put in working order in case of fire. The floors of all departments are kept constantly sprinkled, and boys are employed to keep them swept free of shavings. In every window are two of the now celebrated Harden hand grenade fire extinguishers, and hose is distributed throughout the works in connection with the Holly system, while even the almost impossible contingency of the Holly not responding, has been provided against by large tanks which traverse the buildings and are kept filled, and to which the hose can be instantly attached. In addition to all these safeguards for the interior of the buildings, a Worthington steam pump has been lately purchased, which can throw two heavy streams of water far over the tops of any of the buildings, while the employes in the different departments have been thoroughly drilled as a fire department, and to additionally stimulate them prizes are given for the most efficient. The pay roll of the company last week included over 400 names, not mentioning the large clerical staff, which is rendered necessary by the tremendous volume of business done, not alone in every territory and state in the Union, but in almost every quarter of the globe where the value of middlings is understood. This will be readily understood when we state that each machine as finished is numbered, and that the numeration now exceeds the enormous number of 13,000, with a present capacity of eighteen machines per day. The Smith company consider their business, large as it is, still in its infancy, and in view of what has just been stated, their confident prediction that the Jackson shops will give constant employment to 1,000 men in the near future, does not seem extravagant. The present officers of the company are: Mr. Geo. T. Smith, president, treasurer and general manager; Geo. S. Bennett, vice-president and secretary. In the office are C. E. Bennett, auditor; H. F. Knapp, purchasing agent; Chas. F. Knapp, cashier and bookkeeper, and W. H. Dickey, in charge of the correspondence. The immediate management of the shops is in the hands of Mr. Geo. F. Sherwood, mechanical superintendent.



GRAY'S NOISELESS BELT ROLLER MILLS. STYLE "B" for SMALL MILLS

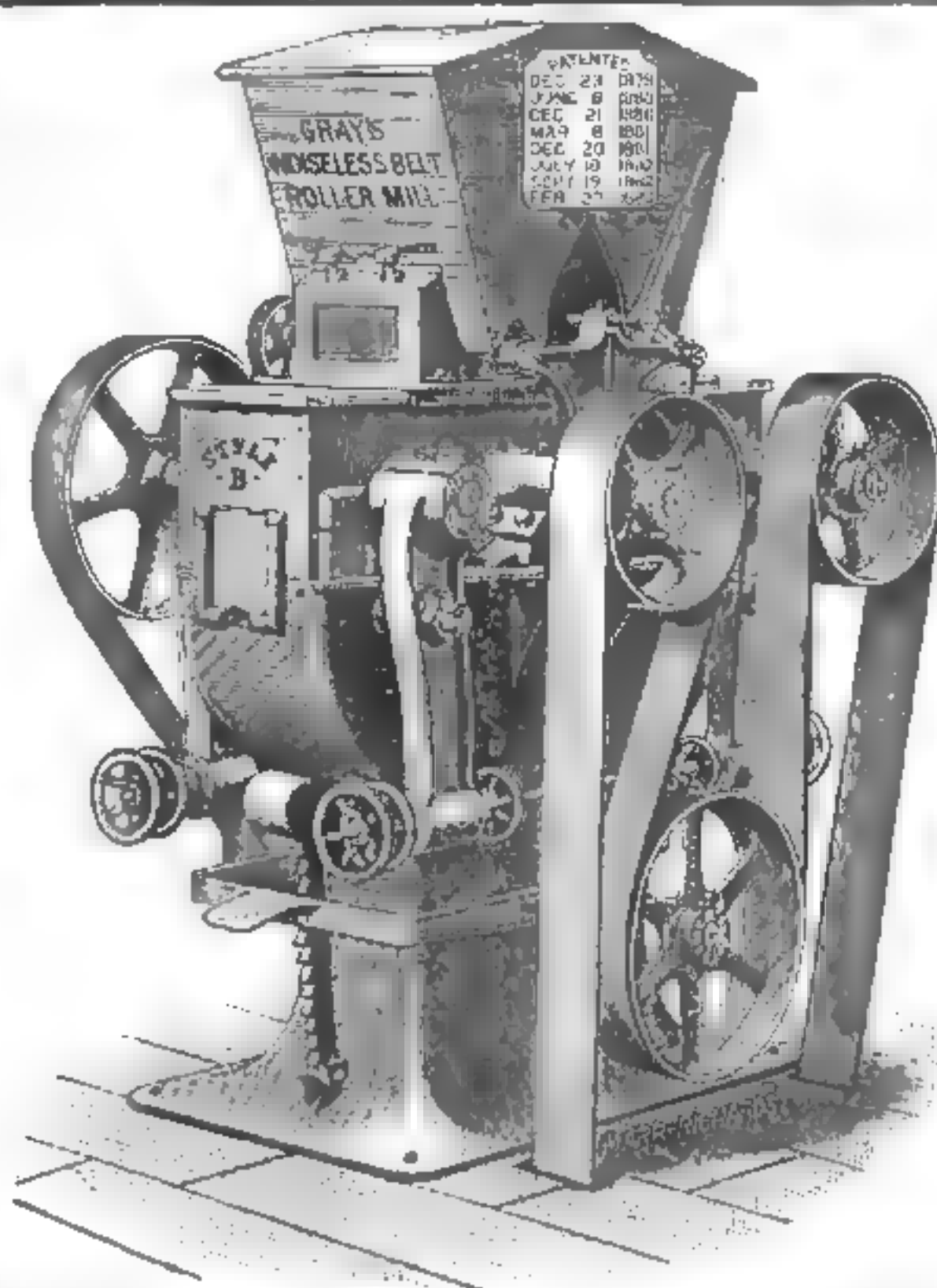
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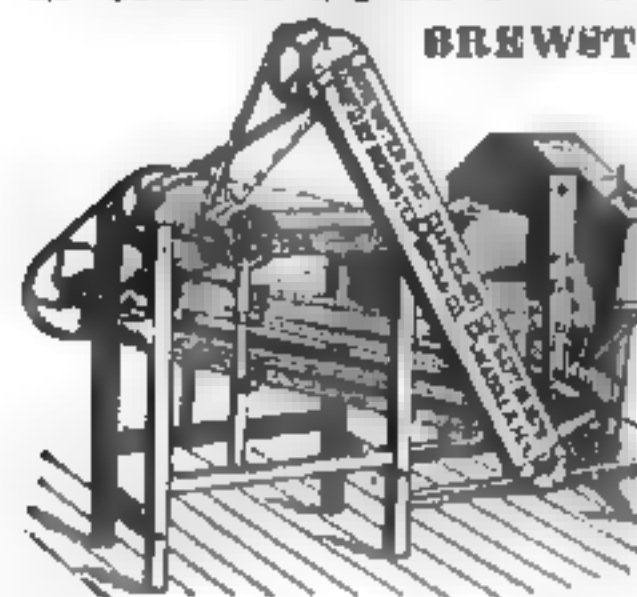
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Buckwheat Refiner
Is the only machine
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The only reliable, practical
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MIDDINGS MILL
Is Strictly Self-Protecting
The Best Adjustment in
the World.
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Perfect Granulator
Grinds Cool, Self-Oiling, Great
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Simplicity and Durability
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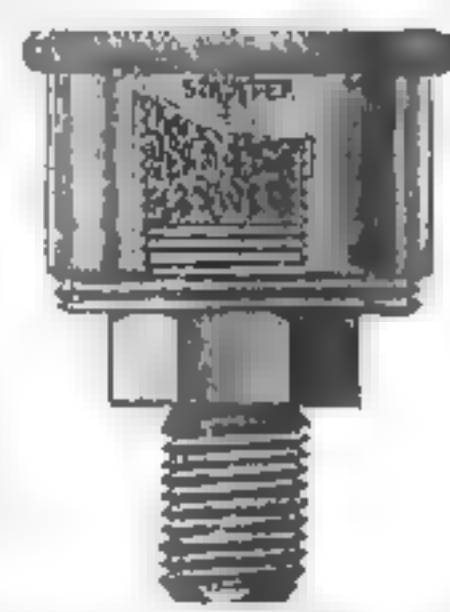
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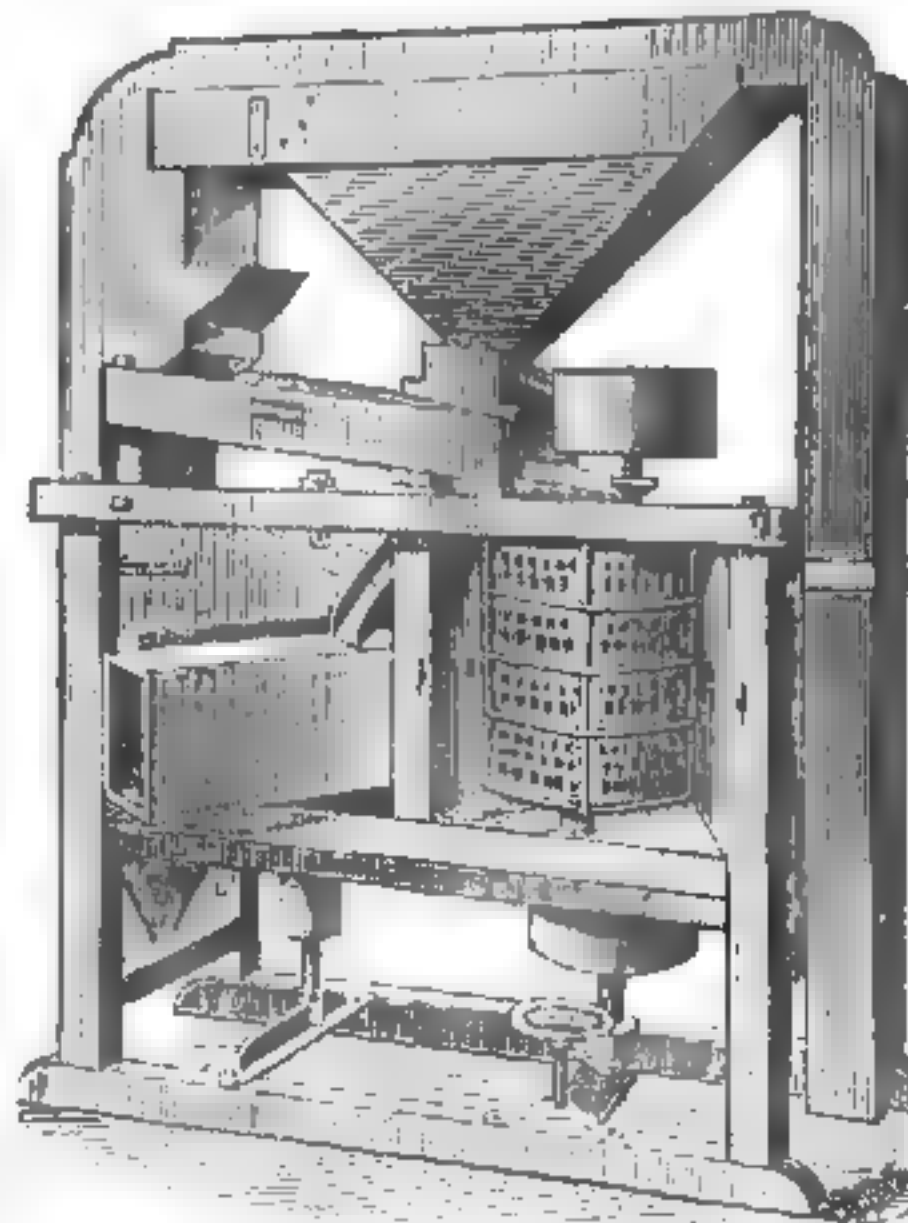
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It will clean, rub and separate wheat, and take out the rat balls,
black steel seeds, joints of straws, cockle and other impurities.
It will also rub off more fuzzy ends and dust from the creases of
the berries, by rubbing the wheat together as it passes up be-
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It will also clean barley and rye.

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ROLLS RE-GROUND

And Re-corrugated to order. Our Ma-
chinery for this purpose is very accurate.
Can do work promptly.

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AGRICULTURE IN NEW ZEALAND.

BY last mail from New Zealand the San Francisco correspondent of *Bradstreet's* received a remarkable statement, in the form of an address from Mr. Firth to his workmen at the annual harvest home at Matamata. Thousands of tons of wheat were harvested, and between eight and ten thousand tons of clover and hay had been cured and stacked this season. The working force consisted of sixty-five white men the season round, besides mowing machines under the superintendence of a native chief and his classmen. Everything was done by machinery, most of which was imported from the United States. Labor was economized to the utmost, but as the result of the year's operations, Mr. Firth announced that he would be compelled to stop cultivation and discharge his hands, owing to the low price received for wheat and wool. It did not pay, he said, even with the best of labor-saving machinery, to farm in New Zealand. And he uses steam plows and traction engines, which he imported from England, in addition to his harvesting machines from America.

This is a very important statement, and the New Zealand press admits that it is an unpleasant truth. In short, it is said that it neither pays to grow wheat nor to raise sheep, because wool is lower now than it has been in England any time in the last fifty years, and every one knows just how it is with wheat. Now, inasmuch as Matamata wheat averages 35 bushels an acre as a usual thing, one is curious to know how it happens that wheat cultivation is so unprofitable. Mr. Firth satisfies an inquirer on this point. It is caused by high wages and short hours. Eight hours are a day's work in New Zealand, and a dollar to a dollar and a half a day and board is farm laborers' pay. This gentleman bore testimony to the reliability and faithfulness of his men, whom he speaks of as friends; but he warned them against upholding an economic system which must drive capital out of the country. His remarks in this regard are of universal application, and might be profitably considered by the apostles of short hours and high wages in this country. Whatever may be said of this theory it will not work out in practice in America any more than in New Zealand.

There appear to be a few mistakes, or at least, misrepresentations in this statement. First of all, it takes time to understand the working and manipulation of the labor-saving machinery, and the end of one year's operation will hardly admit of any intelligent judgment with regard to their economy, unless handled by competent men. Why the cultivation of wheat in a region that averages thirty-five bushels to the acre should prove unprofitable when worked by improved machinery, will appear a mystery to the American farming population. In the same way that the statement that the farm hands pay for eight hours work, is from one to one and a half dollars per day and board, may cause rosy visions of a new Eldorado in the mind of numbers of American laborers, and result in a stampede for Australia. The question is, during how long a time are such wages paid, and how many laborers are needed when most of the work is done by machinery? Is the comparatively small amount which makes up the difference between the expenses of the well paid laborer and poorly paid help sufficient to decry as unprofitable wheat growing in lands so rich as to yield thirty-five bushels to the acre? Such questions

are apt to raise doubts as to the application to the whole of Australia of the work of one farm, and fuller and more elaborate figures are needed to convince us of the truth of these assertions.

MILL FIRES IN GERMANY.

Die Muehle reports a long list of mill fires during the first half of May. On the 5th of May a fire destroyed the upper story of the barley mill of Messrs. Hirschfeld, in Atzgersdorf, near Prussia. On May 12 the "millhill" near Jessen, Prussia, was totally burned down. On the same day fire consumed Mr. Rieckhoff's windmill, near Wittenberg, Meckl., and lightning destroyed a mill in Schelswig. May 12 appears to have been a special day for millers, for a fire started on the evening of that day in the roller mill of Mr. Sieder, in Berndorf, Austria, and its total destruction was prevented only by an early discovery. During the same night the so-called "bush mill" near Zerbst, Germany, burned down, making the sixth mill consumed by flames in that vicinity during the last ten years. On May 14, lightning damaged the roof and upper story at the flour mill at Ober-Hermsdorf by Gottesberg, Germany, and another mill in Wohlmirstadt, was struck by lightning on the following day. The canal mill of Mr. Schnell, in Wickersdorf, Austria, took fire on May 16, probably through carelessness, and was totally burned down.

NOTES.

Reports from Austria-Hungary state that rust has appeared among the wheat in many sections.

It is proposed to hold an international grain and seed exhibition during the coming September in Lemberg, Austria.

The weather in Germany leaves nothing to desire with regard to the crops, the rye plant having recovered from the effects of the late frosts.

A Peasants' Convention will meet in Berlin, July 4th, and will advocate among other things protective duties on agricultural products, reduction of railway tariffs on such, and a more equitable distribution of taxation on landed property.

The *Berliner Tageblatt*, referring to the project of the French government to celebrate the centenary of the French revolution by an international exhibition at Paris, expresses a doubt whether the great powers of Europe will consent to participate in an exhibition which reviews such sad memories.

From the north of Russia, although navigation is open, very little is being done for export in wheat, the prices asked being generally too high. From south Russian ports, too, business is almost at a stand. At Odessa (May 13th) there was the same small extent of business and very little change in prices.

France is ahead of most countries in the encouragement she gives to commercial education. The senior students of the Paris high school of commerce are now off on their yearly trip to the manufacturing and commercial districts of the North and Belgium, where they will have practical demonstrations of what has been taught them in the class-room. For the best general report of the journey, the Paris Chamber of Commerce gives a sum of money toward defraying the expenses of the successful pupil for a further and practical study of any branch of manufacture.



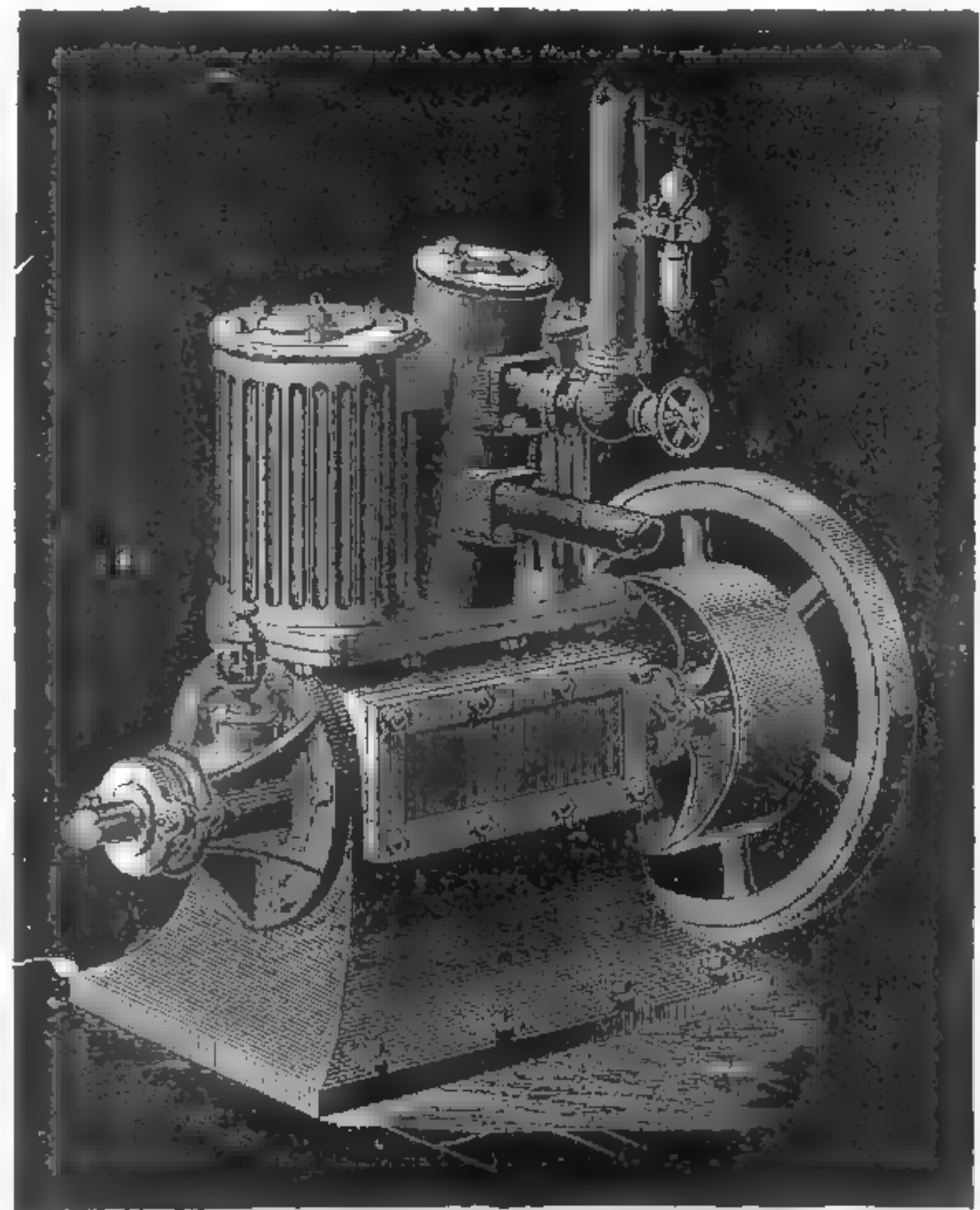
A tool for Cutting, Leveling and Polishing the Furrows and Face of Millstones. Eight inches long, 2 1/4 inches wide, 1 1/4 inches thick. Received the highest and only Award given to Polishers at the Millers' Exhibition, Cincinnati, Ohio, June, 1880. For facing down high places on the buhr, this tool has no equal, and can be done much better and in one-sixth the time than with the mill pick. It is much larger, cuts better, can be used on either face or furrow, can be used until the corundum is entirely worn out on one side and then turned on the other side. Has over four times the amount of corundum and when the corundum is worn out can be replaced in the handle at a small cost. Sent by express, \$3.50. Satisfaction guaranteed, or money refunded. Address **HORACE DEAL, Bucyrus, Ohio**

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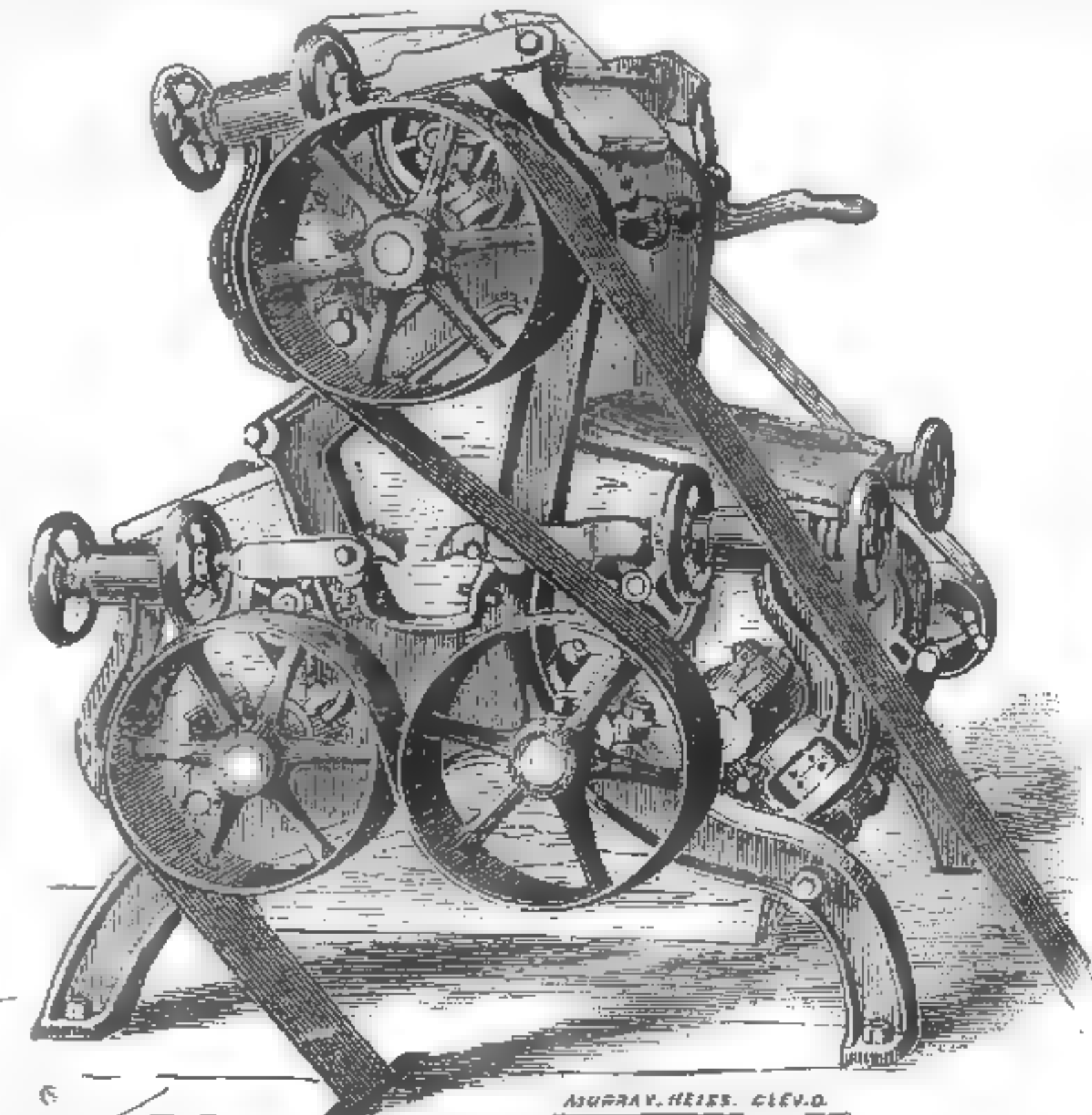
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We can make small mills equal to large ones. Write us for Rock Bottom Prices, and Undoubted Reference of parties using our Breaks and Rolls. By adopting our system you can save money, also save from 8 to 10 per cent low grade over other systems, and keep both quality and yield up to the best.

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As applied to small mills. MR. ODELL has developed
a complete and

PERFECT SYSTEM FOR SMALL MILLS

Of Thirty to Seventy-Five Barrels Capacity per day,
which will revolutionize the building of such mills.

ASTONISHING RESULTS ARE PRODUCED!

In advance of anything heretofore shown, and at

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We invite millers from all sections to write to us for particulars, or make us a visit and investigate. We can save you a good deal of money, and give you a mill unsurpassed by any.

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HAS BEEN AWARDED
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 AT THE
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Office of THE MILLING WORLD.

Buffalo, N. Y., June 18, 1884.

Nearing the close of the crop year we find an inanimate wheat market, and, practically, a total absence of speculation. There is, to be sure, some trading but it is almost wholly of the scalping order, the rule governing the few trades made being, apparently, to buy on the breaks and sell on the bulges, no matter how small the break or the bulge may be. Our export of wheat for the eleven months ended May 31, were 64,259,882 bushels, as compared with 101,397,258 bushels for the same period last year, showing a falling off of 37,137,376 bushels. On the other hand we find that the exports for last month were 4,748,520 bushels, as compared with 2,972,397 bushels in May '83 or an increase of 1,776,123 bushels. It is pretty generally admitted that our exports have been materially curtailed by the placing of fictitious values upon our surplus. The near approach of another harvest, has served to render holders desirous of converting their stocks into cash, and suitable modifications of ideas of value have enabled buyers for export to make the purchases which resulted in a material movement of grain last month. The comparative freedom of movement last month has served to strengthen the impression prevalent in some quarters that stocks of wheat in other countries have been brought to such an extremely low stage, that a vigorous export movement will, in the very near future, be inaugurated, but in face of the fact that better than average crops are reasonably assured in importing countries, and every indication pointing to a crop above the average both in quantity and quality at home, it is difficult to see wherein a bull movement would find tangible foundation. Certainly the conservative, and necessarily safest, element of the trade does not anticipate high values. Several of our contemporaries are prophesying a bulge in the markets, and one goes so far as to request its readers to stick a pin in its predictions, but favoring conditions, at least at this distance, appear to be entirely absent. That attempts will be made to advance values, will not be doubted, but that success will wait on these attempts, is certainly questionable.

In its review of the trade, the New York Commercial Bulletin says: The statistical position is commented upon as being so strong that it is weak. This apparent paradox is explained in the fact that the low price of wheat has deprived the market of the confident short interest that would be necessary to a successful bull movement, while the association of figures has been such as to lead more or less buying on the statistics. The parties thus buying are waiting now for some one to pay them a profit. But the necessary "lamb" are not forthcoming; the speculative public has been shy ever since the Marine Bank set in motion the interrogation point as to whether or not the country is financially and commercially sound to the core. To a large and important class, the question is unanswered, and either from a lack of funds or a lack of courage, the masses are cautious to a degree that keeps them away from all the speculative staples. Without this element to help in an upward movement, any attempt to bull the market at this time, strong as the "position" may seem to be, would be very much in the nature of an attempt of a man to lift himself up by pulling at his boot straps. There is no "good buying" but the buying is as "good" as the selling. In either case the ventures are of the shower-bath order, "quick in and quick out." "Stop orders" are the popular orders, and not many of them.

The city mills are taking orders at \$5.05; or rather, they are willing to take orders at \$5.05. They are not very successful in getting business. But the price they name sets the key for the rest of the market, and anyone who has flour for sale, that is in quality the equivalent of the city ground must conform with the \$5.05 level or there is no sale. And, very likely, there is no sale on this basis, for the market is dull, duller in fact than it usually is. The market in its entirety is not particularly changed. There is a good deal of irregularity. Concessions would fail to increase the buying. The market closes weak. Rye flour

is scarce; arrivals are also light; this makes a firm market at from \$3.70 to \$4.00, but the demand is slack. Corn goods are dull. Bag meal quiet and steady. Mill feed is steady at unchanged prices with demand moderate.

FOREIGN EXCHANGE.

There was a very limited business in sterling, but the tone of the market was very steady. The posted rates were 4.85½@4.86 for sixty days, and 4.87½@4.88 for demand. Actual rates were as follows: Sixty days', 4.84½@4.85; demand, 4.86½@4.87; cables, 4.87½@4.88; commercial bills, 4.83@4.83½. Continental exchange was very quiet, and rates were: France, 5.10½@5.18½ and 5.16½@5.16½; reichsmarks, 94½@94 and 95½@94½; guilders, 40@40½ and 40½@40½. The closing posted rates were as follows:

London	60 days.	30 days.
Paris francs	4 85	4 87½
Geneva	5 17½	5 18
Berlin, reichsmarks	5 18½	5 14½
Amsterdam, guilders	96	96½
	40%	40%

BUFFALO MARKETS.

FLOUR—City ground clear Duluth spring \$5.25@5.75; straight Duluth spring, \$5.75@6.00; amber, \$5.75@5.85; white winter, \$5.50@5.75; new process, \$5.75@7.00; Graham flour, \$5.25@5.50. Western straight Minnesota bakers, \$5.75@6.00; clear do, \$5.25@5.75; white winter, \$5.75@6.00; new process, \$5.75@7.25; low grade flour, \$2.50@4.00. CORNMEAL—Market steady, with a fair demand. Coarse, \$1.20; fine, \$1.30 per cwt. RYE FLOUR—In fair demand at \$3.75@4.25. OATMEAL—Ingersoll, \$5.75; Bannerman's granulated, \$6.00; Schumacher's Akron, \$6.25 per bbl. BUCKWHEAT FLOUR—Demand fair at 8.50 per cwt. WHEAT—Nominal. At the Call Board No. 1 hard Northern Pacific offered at \$1.06 June, \$1.05½ asked \$1.05 bid July, \$1.05½ asked August. Milling white offered at \$1.02½, and No. 2 red at \$1.00. CORN—Quiet. Offered at 59½c June, 59½c asked 58½c bid July, 60½c asked 60c bid August, 61½c asked 60c bid September. OATS—Mixed 36@36c; No. 2 white 38@38c; State from wagons 43@44c. BARLEY—No. 1 Canadian 88@90c, No. 2 do 80@83c, No. 3 do 70@75c, six-rowed State 75@78c. RYE—No. 1 Western nominal at 71c.

NOTES.

In New York all flour inspected as sound is branded with the name of the New York Produce Exchange, the grade it represents and month and year of inspection on each sack and barrel.

The Canadian government proposes to abolish all tolls, harbor dues and port charges on the St. Lawrence water route, in order to attract grain shipments from the west to Montreal as an offset to the abolishment of tolls on the Erie canal.

At a meeting of the business men of Ashton, Dak., it was decided, as no one had accepted the offer of \$2,000 and land to build a flouring mill, an agent should be sent out to make a contract for a fifty-barrel mill. Over 130,000 bushels of wheat was marketed there from last year's crop, and it is estimated that the amount this year will exceed 400,000 bushels.

Two representatives of the Chicago Board of Trade visited the New York Produce Exchange on June 12, and had a conference with the Committee of Information and Statistics in regard to the suppression of the bucket shop business. The committee, through its chairman, C. A. Pool, promised the earnest co-operation of the Exchange in effecting this result.

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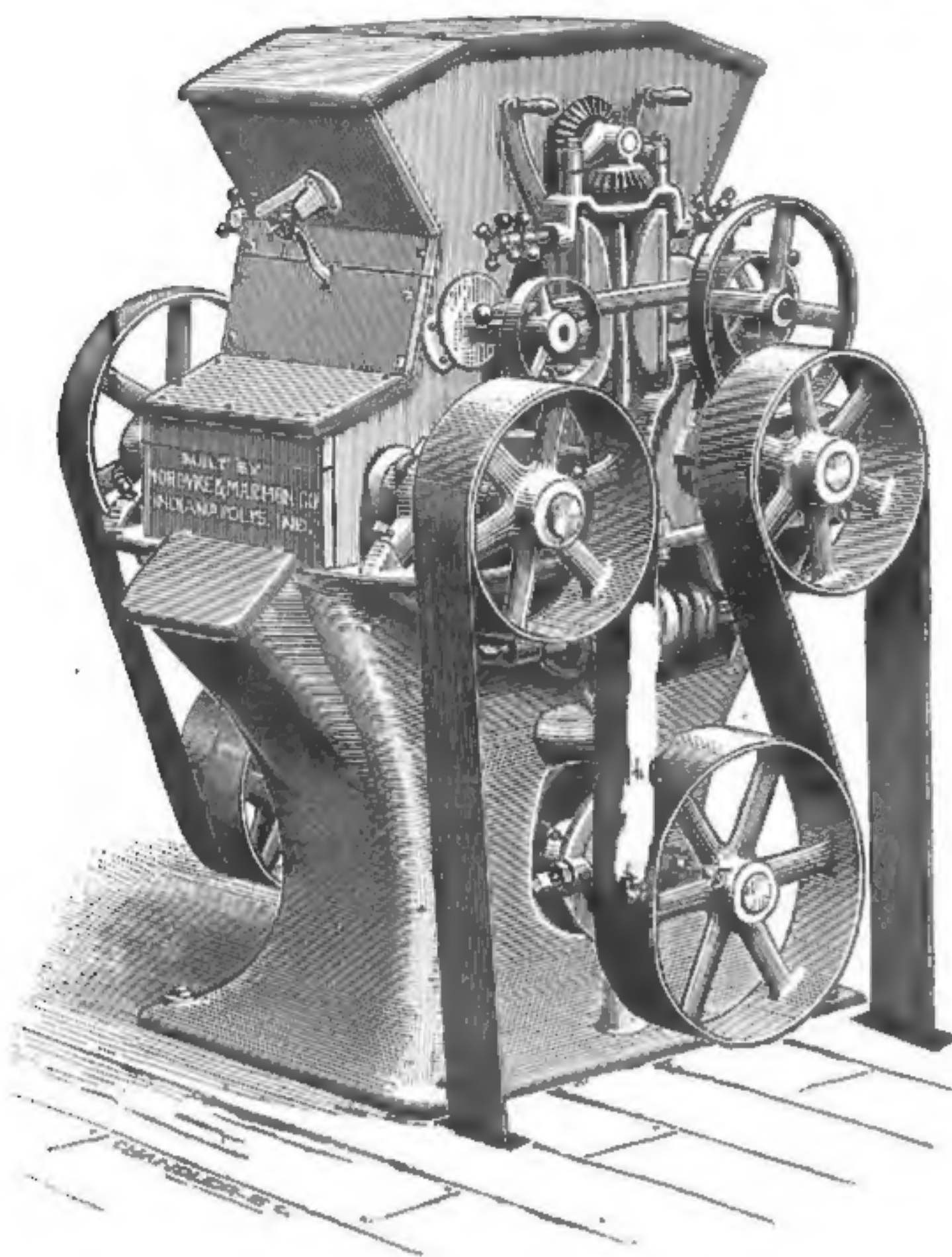
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NORDYKE & MARMON CO., INDIANAPOLIS, IND.

Builders from the Raw Material of

ROLLER MILLS, CENTRIFUGAL REELS, FLOUR BOLTS.

WE ARE THE SOLE OWNERS FOR THE UNITED STATES OF ALL THE PATENTS UPON THIS ROLLER MILL.



This Is the Only Roller Mill Made Having All the Essentials Needed In Successful Milling.

500 BARREL MILL IN MISSOURI.

Read what an Old Miller who has Thirty-Four Pairs of these Rolls in Constant Use, Says:

MESSRS. NORDYKE & MARMON CO., INDIANAPOLIS, IND.

Gentlemen: In regard to the workings of our new mill erected by you, will say it is working fully up to and beyond our expectations. Our average work is fully 33 per cent. over your guarantee. Since starting our mill last July we have had no complaint of our flour from any market where sold. It gives universal satisfaction, and we have it scattered on the trade from Chicago to Galveston, Texas. Our yields are all that are attainable. We have tested it on both Spring and Winter wheats with satisfactory results on both varieties. Since the mill was turned over to us we have not changed a spout or a foot of cloth, nor have we found it required to make any changes. We have run as long as six days and nights without shutting steam off the engine, not having a "choke" or a belt to come off. The mill is entirely satisfactory to us, and for a fine job of workmanship, milling skill and perfection of system, we doubt if it is surpassed in the United States to-day. It is certainly a grand monument to the ability and skill of Col. C. A. Winn, your Milling Engineer and Designer. You may point to this mill with pride and say to competitors, "You may try to equal, but you will never beat it." Wishing you the success that honorable dealing deserves, I am,

OFFICE OF DAVIS & FAUCETT MILLING CO.,
St. JOSEPH, MO., Nov. 28th, 1883.

Yours, etc.,
R. H. FAUCETT, PRES.

500 BARREL MILL IN ILLINOIS.

MESSRS. NORDYKE & MARMON CO., INDIANAPOLIS, IND.

Gentlemen: We started up our mill in June last year, and it gives us pleasure to say that your Roller Mills are doing splendid work and give us no trouble. Your milling program required no changes, and concerning yields, we get all the flour from the offals, and we sell our best grades in the principal markets of the United States at the highest prices offered for any flour. All the machinery made by you is first-class, and we would not know where to purchase as good.

OFFICE OF DAVID SUPPGER & CO.,
HIGHLAND, ILL., Jan. 10, 1884.

Yours respectfully,
DAVID SUPPGER & CO.

125 BARREL MILL IN INDIANA.

NORDYKE & MARMON CO., INDIANAPOLIS, IND.

Gentlemen: The 125 barrel All Roller mill you built us has been running all summer, and does its work perfectly. Before contracting with you for this machinery we visited many Roller Mills throughout the West and Northwest, built by the different leading mill-furnishers, and from all we could see, those built by you seemed to be giving the best satisfaction, and this is why we bought our machinery of you. Our mill comes fully up to your guarantees, and the capacity runs over your guarantees. The bran and offal is practically free from flour, and our patent and bakers' flour compares favorably with any we have seen elsewhere. I don't think anyone can beat us. Your Roller Machines are the best we have seen; they run cool, and the interior does not sweat, and cause doughing of the flour. Judging from our success, we would recommend other millers to place their orders with you.

LAPEL, MADISON COUNTY, IND., Jan. 10, 1884.

Yours truly,
J. T. FORD.

Letters on file in our office from a large number of small roller millers giving as favorable reports as above. A portion will be published as occasion demands.

SPECIAL MILLING DEPARTMENT!

Mill Builders & Contractors--Guarantee Results

Motive Power and Entire Equipment of a Modern Mill Furnished under one Contract.

PATENT MILLSTONE CEMENT

Invaluable to Millers for Repairs and Seams in French

This is a new article of manufacture, and in common use by millers. It is much cheaper, son. It is perfectly harmless, containing nature and attains the hardness of French only fills the cavity, but adheres to and begrinding. Good Millstones are now in use, composed entirely of



ing and Filling the Joints, Cavi-Burr and other Millstones.

greatly superior to the preparations now in and can be applied by an inexperienced person of a poisonous nature. It has the Burr Stone, wears evenly with it, and not comes a part of the Stone, and assists in this preparation. The

LEADING MAKERS ARE ADOPTING IT TO BUILD THEIR MILLSTONES.

For miller's use, it is put up in cases of about 50 lbs. Price per case, \$5.00.

We cannot open an account for so small a sum, therefore Cash should be sent with order otherwise we shall send C. O. D. by Express, collecting for return of the money.

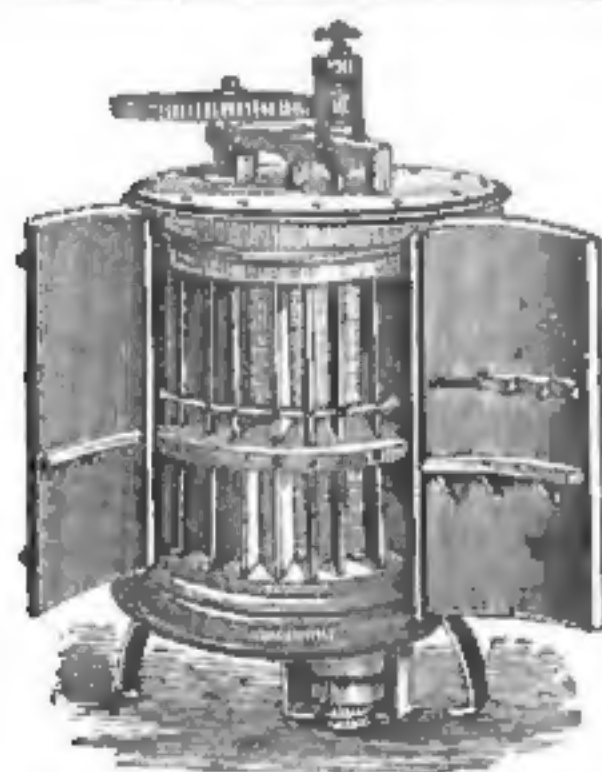
For manufacturers, we furnish in bbls. of 300 lbs. Price upon application.

Emery Rub Stones, for hand use in Finishing the Furrows and Faces of Millstones.

Union Stone Co., 38 & 40 Hawley Street, Boston, Mass.

Union Emery Wheels, Emery Wheel Machinery and Tools a Specialty. Wooden Polishing Wheels, Grinders' and Polishers' Supplies. Catalogue on Application.

EMERY, QUARTZ, CORUNDUM.



THE IMPROVED UNITED STATES BRAN DUSTER

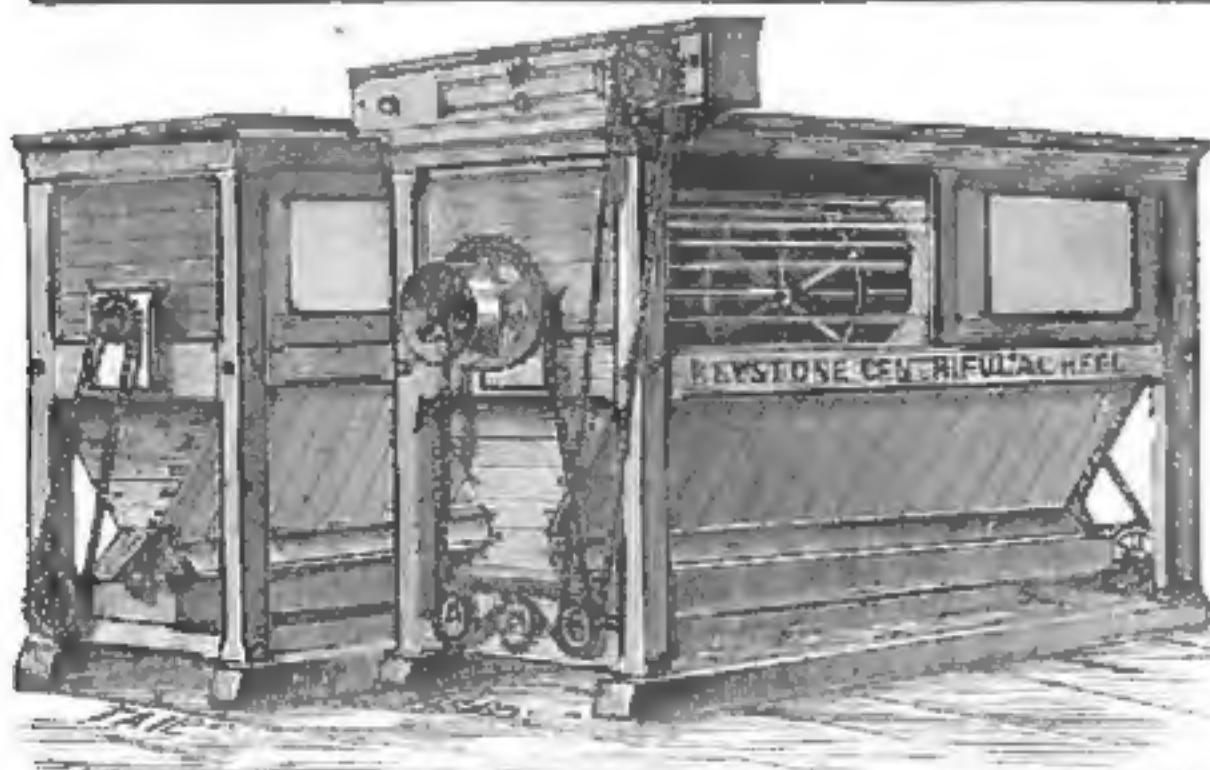
The brushes can be adjusted while the machine is in motion.

Those now using this machine can affirm to the great saving insured by so doing, as they very soon repay their cost.

EVERY MACHINE GUARANTEED TO GIVE SATISFACTION.

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GEORGE OLIVER, CORNER MILL AND BROWN STREETS, ROCHESTER, N. Y.



KEYSTONE CENTRIFUGAL REEL

—PATENTED MAY 6th, 1884.—

Drag Brush Feed, Tightest Heads, Best Results. Cheapest and Best on the Market. Adapted to all Kinds of Milling. The New Drag Feed Thoroughly Protects the Silk. Sent on Trial to any Responsible Miller.

ROLLER MILLS, SCALPING REELS, PULLEYS, SHAFTING AND ALL KINDS OF MILL IRONS.

Full Stock of Dufour and Dutch Anchor Bolting Cloth.

BEST QUALITY FRENCH BURR MILLSTONES, FOR MIDDINGS, WHEAT AND FEED.

Leather, Rubber and Cotton Belting, Smut Machines, Purifiers and everything belonging to a Flour Mill furnished at Lowest Market Prices. For Circulars, Prices and Full Particulars, address the Manufacturer,

C. K. BULLOCK, 1357, 1359, 1361 RIDGE AVE., PHILADELPHIA, PENN.

GREAT TRIUMPH IN INVENTION

The Simplicity so long sought after in Roller Mills attained at last.

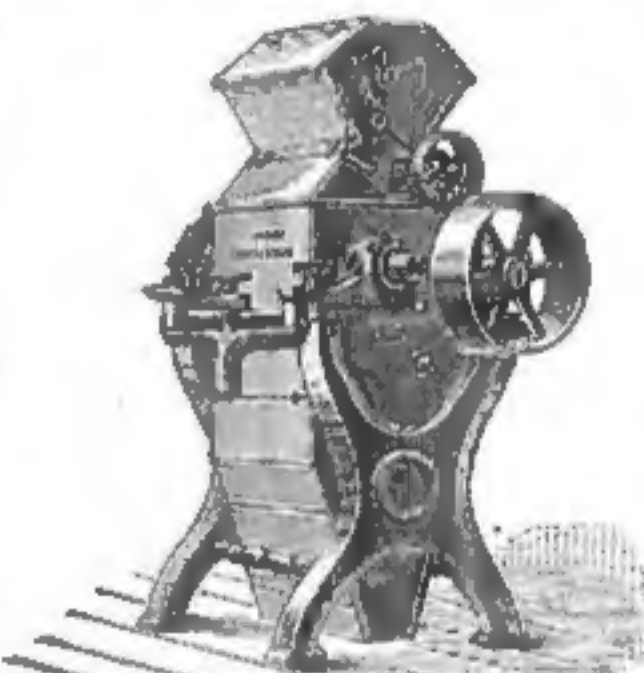
ONE, TWO, OR FOUR BREAKS IN A SINGLE FRAME

SIZES OF ROLLS 9x18 and 7x14 INCHES.

NO CROSS BELTS. NO FRICTION. NO LOSS OF POWER.

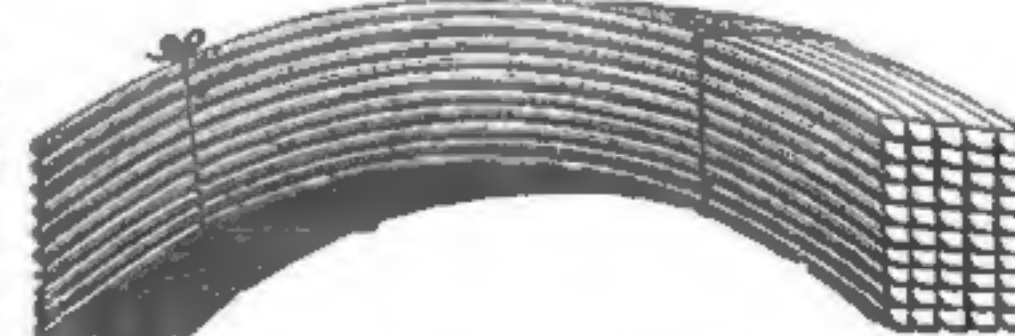
Reduction Rolls, Bolting Cloth, Purifiers, Middlings Mills and Bolting Chests. General Mill Furnishing Supplies.

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HEAD LININGS AND COILED BARREL HOOPS.

Our Celebrated Patent Head Linings are straight Rounded on their upper edge nail on barrel. They will freely through the square are packed. We can furnish from twelve to seventy-two GOOD Head Lining can



Round Edge Bent Barrel grained from end to end, and crimped or bent ready to not mold, as the air circulates bundles of 250 in which they them any desired length, inches, and as cheap as any be sold.

CAN FILL ALL ORDERS AT SIGHT.

REED & SILL COOPERAGE CO.,

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EVERY PIECE—FOOT—THREAD —YARD—INCH—MESH— WARRANTED

PURCHASE EITHER AND ONLY

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The Noye Cloth is made expressly for our own use by C. Schindler-Escher, Zurich, Switzerland, and is the only cloth in the world which can be recognized by the **COLORED THREADS IN THE SELVEDGE**, thereby enabling us to guarantee the different qualities, and the purchaser to know what he is getting every time. This exclusive privilege is insured to us by letters trade mark.

One Green Thread Indicates Standard Quality.

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Two Red Threads Indicate Double Extra Quality.

All these qualities are made **BEFORE** the piece is woven and not by mechanical means afterwards.

Numberless attempts have been made to palm off inferior grades of cloth for **DUFOUR**, but up to the present time all such efforts have signally failed. We have handled this silk since its first introduction into this country, and in purchasing of us millers can rely upon getting.

THE GENUINE DUFOUR.

It is particularly noted for its superior qualities in the way of **STRENGTH, ELASTICITY, UNIFORMITY IN MESH, REGULARITY OF THREADS**, and freedom in bolting under all temperatures

CLOTHS MADE UP IN A SUPERIOR MANNER BY PATENTED MACHINERY.

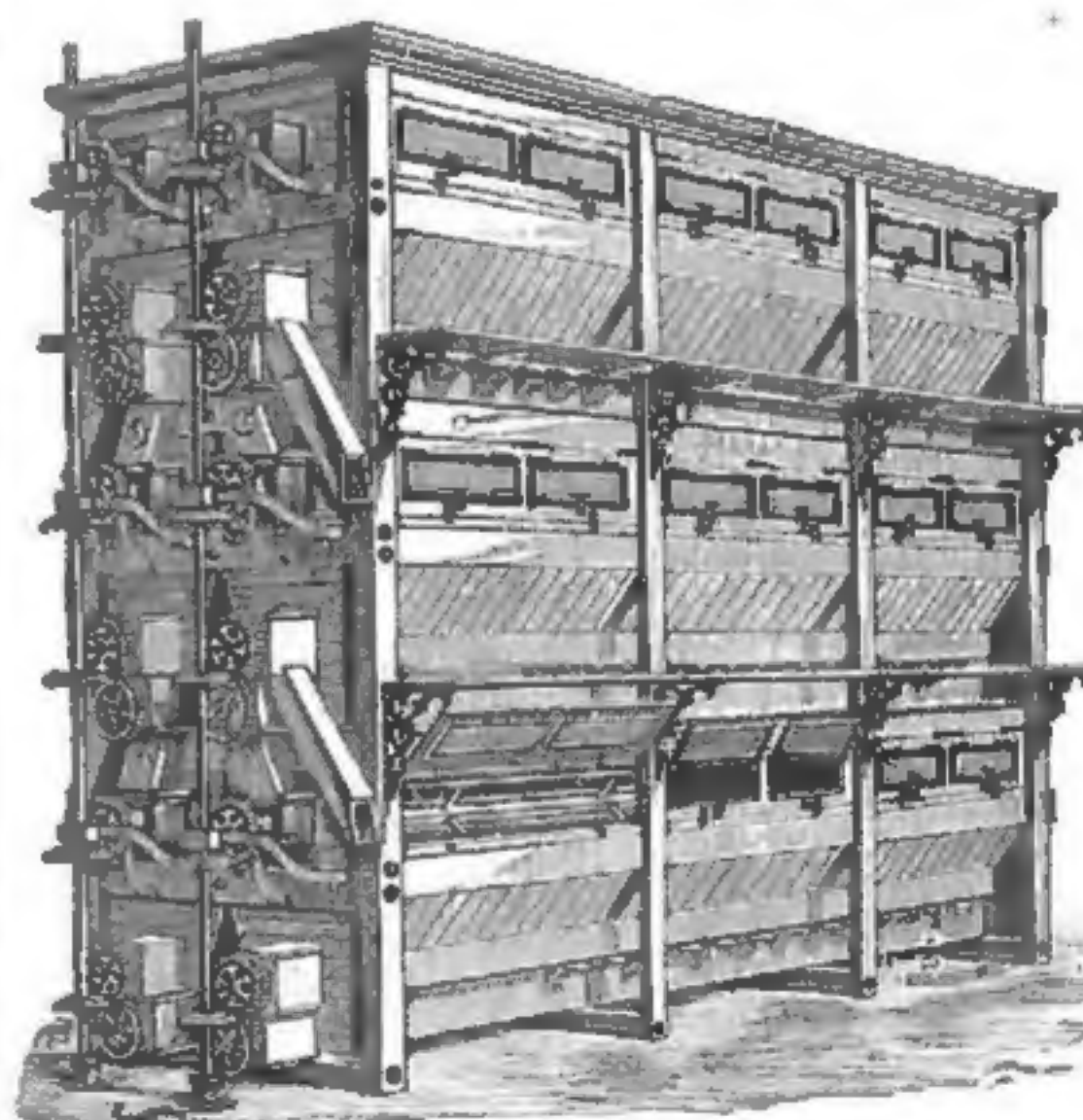
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BUFFALO, N. Y., U. S. A.

BEWARE OF SECOND-HAND STEVENS' ROLLER MILLS OFFERED BY ONE OF OUR COMPETITORS THEY WERE MADE IN 1881 AND HAVE SINCE PASSED THROUGH A FIRE.



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—is—
C. SCHINDLER-ESCHER'S.
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STRONG AND DURABLE.
Ask Any First-Class
Mill Furnisher
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**Impr'ed Milling
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ALL KINDS MILL SUPPLIES

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THE EXCELSIOR ANCHOR BOLTING CLOTH TO THE FRONT.

RECOGNIZED AS THE QUEEN OF ALL BOLT CLOTHS BY ONE-THIRD OF THE MILL OWNERS, MILLERS AND BUILDERS IN THE UNITED STATES, AND THEIR VERDICT IS "GIVE US THE EXCELSIOR AND NO OTHER!" SEND FOR DISCOUNTS AND PRICES FOR MAKING UP, WHICH ARE GREATLY REDUCED.



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